

CANADIAN GEOGRAPHICAL JOURNAL

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THE SEVENTH VICTORY LOAN INSIGNIA is an adaptation of the shoulder sleeve insignia of the Supreme Headquarters, Allied Expeditionary Force. "Upon a field of heraldic sable (black) representing the darkness of Nazi oppression, is shown the sword of Liberation in the form of a Crusader's Sword, the flame arising from the hilt and leaping up the blade. This represents avenging justice by which the enemy power will be broken in Nazi-dominated Europe. Above the sword is a rainbow emblematic of hope containing all the colours of which the National Flags of the Allies are composed. The heraldic chief of azure (blue) above the rainbow is emblematic of a state of peace and tranquillity, the restoration of which to the enslaved people is the objective of the United Nations."

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NATIONAL WAR FINANCE COMMITTEE

CANADIAN GEOGRAPHICAL JOURNAL

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Editor

—

Gordon M. Dallyn

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth and other parts of the world in which Canada has special interest.

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The articles in this Journal are indexed in the *Reader's Guide to Periodical Literature* and the *Canadian Periodical Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

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PREFACE

Ontario, one of Canada's richest provinces, is blessed with a huge forest area of over 100,000,000 acres, her greatest natural resource. This rich heritage of the people has many values. It is the greatest drawing card we have for tourists, with Ontario attracting 70 per cent of Canada's total. The forest is the home of wild life. It is the reservoir of water and it aids to prevent soil erosion.

A few facts may serve to show the importance of Ontario's forest industries in her economy. Last year, the capital invested in her forest industries amounted to \$234 millions, more than \$100 millions above the capital investment in primary iron and steel. Employment of labour approximated 50,000, just about twice the number employed in the manufacture of electrical apparatus and supplies. Total forest industry payroll ran around \$44 millions, just above the total salary list of the automobile industry.

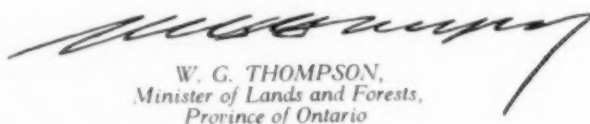
Net value of forest products was \$90 million, as compared with \$75 million worth of automobiles and parts. Newsprint is away up on the top rung by itself as Ontario's greatest export item. Average employment over a three-year period totalled 5 million man-days.

No one can foretell the future, but one thing is evident, — the demand for wood is ever on the increase. It is one of the most versatile materials known to man. In addition to the more prosaic forms of wood which every one recognizes, there are such items as rayon, staple fibre, gun powder, cellophane, alcohol and plastics, which the public does not commonly associate with wood. The wizardry of modern science is rapidly developing a myriad of new products which promise to place wood in the front rank of all raw materials in the World of To-morrow. There is no shortage in demand. The people of Ontario possess great forest wealth—a wealth that requires protection from the enemies of the forest, one of the deadliest of which is fire.

"Wings over the Bush" gives an account of the integral part which aircraft plays in the province's forest protection system. It is essentially a story of the birth and development of the Ontario Provincial Air Service covering the twenty-year period from its establishment to the present date.

An attempt has been made to record the progress of this pioneering flying service, and, at the same time, bring out some of the colour in the events of those years which have been marked by man's conquest of space in the northern bush country by means of air travel.

I take this occasion to pay tribute to the men of the Provincial Air Service whose constant efforts, application to duty and forward thinking have placed it in the forefront as the greatest aviation service of its kind in the world.


W. G. THOMPSON,
Minister of Lands and Forests,
Province of Ontario



WINGS OVER THE BUSH

by A. R. FENWICK*

THE stutter and cough of a seaplane's engine broke the stillness of the forest; then the full roar echoed from the hilly shores as the plane taxied up the lake, its pontoons leaving twin wakes behind. On the step, and soon it was off. It climbed steadily, and levelled off in a northern "bee-line".

This was a plane of the Ontario Provincial Air Service winging its way to service a forest fire in the District of Thunder Bay on June 30th, 1944. At three o'clock in the morning the Chief Ranger had roused the pilot by phone from a sound sleep to ask how soon he could get away to size up a fire on the west shore of Lake Nipigon which had been located the previous evening. The pilot went over to the Chief's office immediately for particulars. He found that the fire was liable to spread rapidly, as it was burning in jackpine slash from logging operations of

the previous year. A high wind had prevailed the day before, with no indication of let-up. The pilot took off at 5.30 a.m. with a foreman, a ranger, a portable gasoline pump unit with hose, an issue of food and miscellaneous equipment.

If we follow the plane as it makes its northerly flight to the scene of the fire, we will see for ourselves how an aircraft goes into duty as an efficient cog in Ontario's forest protection system. "There's the smoke now", the pilot says, pointing to the northwest. "I figure it's twenty-five miles ahead. It's unusual to see a fire puffing up that strong so early in the morning."

He adjusts the ear-phones of his short-wave radio set, pulls the switch and calls the Chief Ranger. "OAW calling Headquarters—Over."

"Come in OAW—Over", replies the Chief.

*Alan R. Fenwick of the Ontario Department of Lands and Forests collected and edited the material for this article which he obtained from various sources. Reference was made throughout to Departmental reports. Contributors included W. R. Maxwell, G. E. Ponsford, G. H. R. Phillips and C. A. MacMillan.



Pilot sends a radio message to the chief ranger.



The aftermath of fire



Equipment ready to be packed in plane for transportation to fire scene.

A canoe serves to transport equipment from plane to shore.



"OAW reporting on Lake Nipigon fire. I'm approaching at 25 miles distance from Gull Bay. She's puffing up strong. Means business! I'll call you back when I reach fire scene—Over."

"OK, OAW, give it a thorough size-up—Signing off."

In ten minutes the plane is circling the fire. The pilot is looking for the best water on which to land fire-fighters subsequently, estimating that the fuel hazard, the probable rate of spread and general methods which should be followed for control. He then calls the Chief.

"OAW calling Headquarters—Over."

"Come in, OAW—Over", replies the Chief.

"OAW over fire. To check last evening's report, — it's on boundary of Nipigon Provincial Forest, on pulpwood limits south of Jackinnes Lake, and just north of Gull River. It's in a jackpine slash from last year's logging, and has now reached an area of about 100 acres. Looks dangerous! Here's what we consider the best line of attack, Chief. I'll land the foreman and the ranger in a small lake two miles up river from the fire. I'll then pick up a canoe, some men and gear at the Gull Bay Indian Reserve. When I get them back to the little lake they can make the short portage to the Gull River and paddle upstream about two miles to the fire. I'll then keep picking up men from the Reserve until I have at least a holding crew of about thirty-five. You'll need to augment this crew from elsewhere up to one hundred to really get it in hand. How's that sound to you, Chief? — Over."

"OK, OAW will proceed as outlined", says the Chief, in reply. "I'll get a fire crew organized at Macdiarmid and send them

up in our boat. Keep in touch with me at regular intervals—Over." (Macdiarmid is located at the southeastern end of Lake Nipigon, fifty miles from Gull Bay).

During the four days that aircraft OAW continued to service the fire it made 95 separate flights, carried 118 fire-fighters, and transported 13,733 pounds of supplies and equipment, including 6 canoes lashed to the side of the ship. At the end of the fourth day the fire had been brought completely under control and another major credit had been chalked up to the already long list of the Provincial Air Service. By that time a regular boat service had been established on the Gull River between the Indian Reserve and the fire. The final area was 700 acres. Undoubtedly it was held to this comparatively small size by the rapid action of aircraft.

The Protection Service

It should not be considered that the forest protection system in Ontario hinges on the Air Service, as it is but a part of a complicated system, built up over a period of years. The field organization of the fire protection service, which was initiated by the Government in 1886, has expanded through the years with the growing appreciation of the value of the forest resources of the province, and a better knowledge of the size of the protection job involved. It has developed in strength and technical skill, employing new means of detection, communication and transportation, as available, to serve its needs. Fire suppression techniques have been developed which compare with military methods of attack and defence.

Forestry boat *Ogina* takes on fire fighters and supplies.

Some of the supplies landed on shore.





Deputy Chief Ranger's headquarters at Northern Lights Lake

For purposes of administration the Fire District of the province is to-day divided into five regions, comprising thirteen districts, which are in turn subdivided into forty-one chief ranger divisions. In the summer season the staff includes from 800 to 1,000 fire rangers, many of whom are specially trained in various skills—as towermen, mechanics, pump operators, truck drivers, telephone linemen, radio technicians, etc. Prior to the organization of the district system, fire rangers spent much of their time patrolling lakes and streams by canoe, and roads and trails on foot. Travel was slow and difficult, and means of communication were non-existent. Thus fire-fighting was rarely effectively applied.

The modernization of the Service began with the purchase of equipment—power driven, portable fire pumps, tools, trucks,

Living quarters and grounds at Biscotasing base, 1944

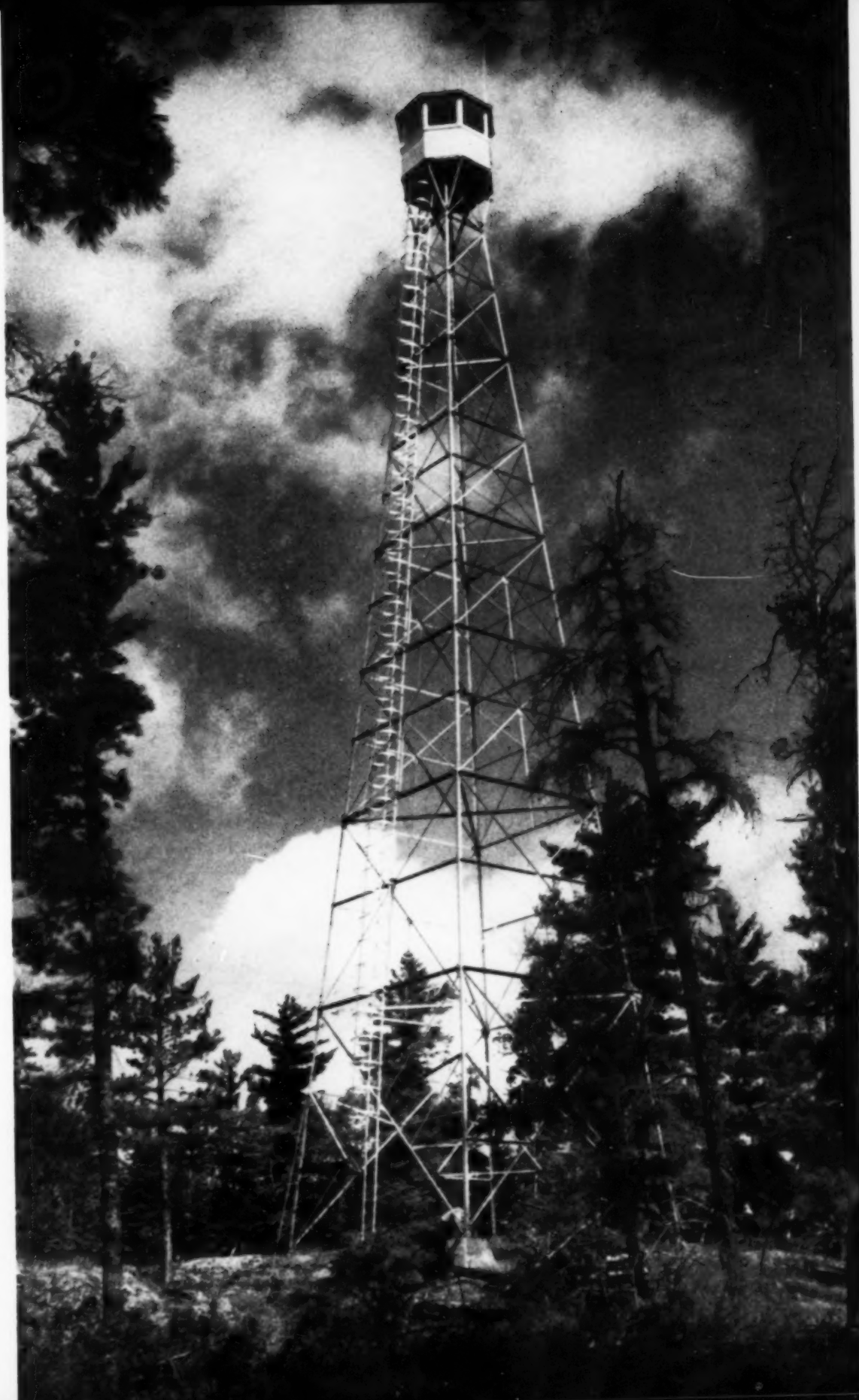


railway motor-cars, motor-boats, aircraft, etc. Concurrently, a programme of building was instituted. A system of steel towers for detection was developed, and connecting telephone lines were strung for rapid communication. Cabins, storehouses, offices, and other buildings to house men and equipment were erected. To illustrate the size of these physical assets to-day, it may be mentioned that the Department has in use to-day 634 portable gasoline pumps, a fleet of 128 trucks, 48 railway motor-cars, 248 motor-boats, 987 canoes, 27 aircraft, 220 steel lookout towers, 4,792 miles of telephone line, and 1,107 buildings of various kinds.

Ontario a Pioneer in Forestry Aviation

It is no chance happening that the Ontario Department of Lands and Forests owns and operates the largest forest fire-fighting organization in the world. This is due in considerable part to the fact that a large portion of the forested areas of the province is dotted with innumerable lakes and streams which make it a paradise for seaplanes. In addition, the great expanse of forested area has few means of rapid transport by road and rail. Due credit must be given, however, to the Ontario Government for its foresight in conceiving and progressively developing the Provincial Air Service.

Right:—Fire detection tower; from such towers as this fires may be quickly detected, and the fire-fighting crews notified immediately by telephone or radio.





Aerial photographs have multiple uses in fire protection and forest conservation work. From photographs such as this, forest types may be determined and timber-cutting operations planned. LEGEND: A—Weeds in lake. B—Scrub. C—Black spruce pulpwood (Cs—Small black spruce pulpwood). D—Dry dump—showing piles of pulpwood. E—Main haul road. F—Marsh grass. G—Dwarf spruce. H—Mature birch and poplar. C.O.—Cut over, showing strip roads running into a haul road.

With regard to the lake and river system which offers such fine facilities for seaplane operation, it may be noted that the general drainage conditions are related closely to the geographical history of the province. The denudation during the advance of the last ice sheet, removing the soil covering and leaving the numerous rock basins free of soil, has contributed to the general "lake-river" character of the forest area of the province. This condition was modified somewhat by the soil deposits laid down in the course of the retreat of the ice sheet. In the regions covered by the glacial lakes, deposits were laid down anew in the depressions between the rock hills, lakes were not formed to such an extent along the drainage courses, and many of the smaller depressions were filled with soil. The area assumed the character of a river country, although in the larger depressions lakes still existed. On the area not covered by glacial lakes there developed innumerable small lakes in the rock depressions. The rivers are frequently a series of lakes with short stretches of fast water between the points where the drainage spills over the rock edges. These characters are most pronounced in the northwestern section of the province. The eastern section was largely modified by the glacial lake deposits, with relatively fewer small lakes and longer stretches of river. These physical factors, coupled with the relatively less adequate road and rail system in northwestern Ontario, is the reason for the greater use of aircraft in that section.

The first conception of the possibilities of aircraft in forest fire protection should probably be credited to Reg. Johnston and

Frank Jenkins of the Department of Lands and Forests. In 1921, Mr. E. J. Zavitz, then having the title of Provincial Forester, became "sold" on the idea of using aircraft for forest inventory work by aerial sketching. Mr. Zavitz hired a flying boat in which Johnston and Jenkins were engaged on a sketching trip in the Sioux Lookout area. They spotted a fire below them on the shore of Cliff Lake. One said he believed that, if they had some equipment, they could easily land and put it out. The other having agreed, they flew to forestry headquarters, picked up some men and tools, returned to the fire, and extinguished it. George Reesor, then a Chief Ranger, became quite enthusiastic over this novel venture and immediately started to make drawings of types of equipment best suited to being carried in planes. Reg. Johnston made strong recommendations to Mr. Zavitz in favour of using aircraft in fire protection, and his chief was receptive. Incidentally, this was the birth of an aerial survey section of the Department, later under the direction of Mr. Johnston. Aerial sketching and photography have proved of immense value to the Government as a whole.

The Annual Report of the Hon. James Lyons, Minister of Lands and Forests, for the fiscal year ending 31st October, 1922, shows that he too was "air-minded". To quote, —

"Aircraft for forest fire detection were used this season for the first time. The operation was carried on in co-operation with the Dominion Air Board, and proved highly satisfactory. Aircraft patrols were carried on from bases

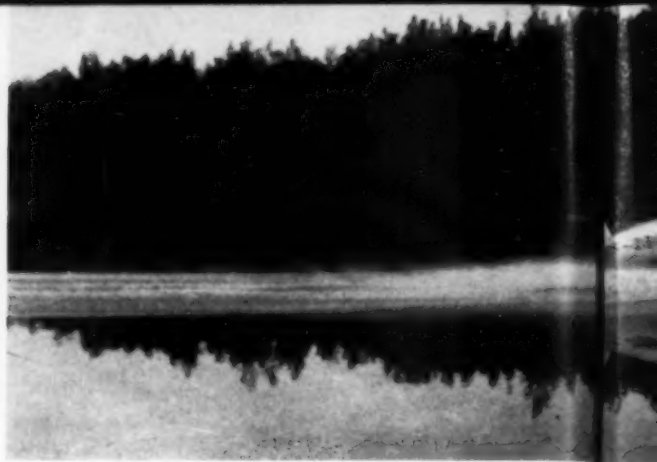
Right:—Plane being used to transport construction materials to a northern outpost.

Below:—Bush telephone at forestry outpost





Fred Stevenson, one of the original pilots—at Remi Lake in 1925



Aircraft taxiing on runway

established at Whitney in Algonquin Park, and at Parry Sound. A total of 613 hours was flown."

It will be noted that the original conception was to employ aircraft to supplement the tower system already in use.

The following year the Laurentide Air Service Ltd., one of Canada's earliest pioneer commercial flying organizations, performed the fire patrols for the Ontario Government.

The Birth of the Provincial Air Service

In 1924 the Hon. James Lyons decided that the Ontario Government should own and operate its own air service. Mr. Lyons called upon Roy Maxwell, a pioneer pilot of commercial flying in Canada, to organize and later direct this new service.

The original problems were two: to recruit an efficient staff of pilots and air engineers, and to obtain a fleet of aircraft suitable for the work, at reasonable cost. It must be remembered that 1924 was only twenty-one years after the Wright Brothers made the initial flight in engine-powered aircraft at Kitty Hawk, and but sixteen years after F. W. (Casey) Baldwin, a Canadian, first flew Glen Curtiss' Red Wing on skis above the frozen surface of Lake Keuka. Only six years had elapsed since World War I which, though it brought aviation to the fore by leaps and bounds, had terminated with aircraft even then described as "flying crates". Lindbergh, Chamberlin and the other members of that galaxy of intrepid distance fliers did not commence their historic flights until 1927.



Aerial photograph of forest fire

ing on the northern lake.



One of the two Loening air yachts used in early days.

Roy Maxwell had little choice of machines. No commercial aircraft were available in Canada, but he was able to acquire fourteen HS2L flying boats which had been in the service of the United States Navy in 1917 and 1918 as U-boat spotters over the North Sea. This same ship was then being used in Canada by the Dominion Air Board, the Laurentide Air Service, Bishop-Barker, and Quigley. It may be truly said that the HS2L pioneered aviation in Canada's Northland. These large ships which, in spite of their seventy-eight foot wing spread, had a low load-carrying capacity, were delivered to the Ontario Service powered with low-compression Liberty motors, their front cockpits complete with gun-mountings. Alteration and modification included engine change-over from low to high compression to increase horsepower and thereby improve aircraft performance. These ships, which were later jocularly referred to by pilots in the service as "squirrel-cages" due to the maze of cross-bracing wires and struts, nevertheless rendered yeoman service, and proved the practicability of aircraft in forest protection work.

Enrolment of operating personnel commenced April 1st, 1924. The first machine, AOH, was delivered to the Service at Toronto Bay April 24th, and the second, AOF, arrived two days later. With these two machines applicant pilots were tried out and received flying instructions under rather trying circumstances on the bay, owing to an abundance of floating debris on the water consequent to the break-up of ice. Soon, however, word was received that Ramsay Lake, near Sudbury, was clear of ice, and instructions were continued there.

Roy Maxwell standing in front of a Loening air yacht, 1926.

For patrol purposes, the province was divided into eastern and western sections, Lake Nipigon being the boundary line, and equal numbers of machines and personnel were apportioned to east and west. The main operating base for the eastern section was located at Ramsay Lake, where the first hangar was erected, a mere shack in comparison with the large modern hangar later built at Sault Ste. Marie, which is provided with machine





Above:—Refuelling an HS2L at Amyot sub-base.



EARLY DAYS IN

Left, top to bottom:—

The Service's first hangar, built at Ramsay Lake, Sudbury district, in 1924

First P.A.S. air base, Ramsay Lake

Orient Bay base—tent camp

Original tent base at Sioux Lookout

Below:—Operating personnel, Remi Lake base, 1925





Above:—Vedette flying boat, in service sixteen years



AYS IN THE P.A.S.

Right, top to bottom:—

HS2L flying boats at a temporary base, Orient Bay

An HS2L at Soo Hangar, 1925

Launching an HS2L from the slipway at original Sioux Lookout base.

Assembling an HS2L when received at Ramsay Lake base from Norfolk, Virginia, in 1924.



Below:—Engine change at Ramsay Lake base, 1924



shops and numerous secondary repair shops. In this eastern area, whose southern boundary was the northern limit of Algonquin Park, three sub-bases were operated, — Amyot, Como Lake, and Bear Island in Lake Timagami.

Sioux Lookout was made the main base in the western section, and all but one of the machines operated from that point, Orient Bay on Lake Nipigon being the single sub-base. Though provided with the same personnel and equipment, and similarly organized, the eastern and western divisions did not operate in the same manner, due to differences in local conditions, degree of fire hazard, communication, etc. Difficulties in communication encountered in the western patrol division hampered operations considerably.

Reg. Johnston of the Forestry Branch, who was forest officer in charge of requisition of flying for forest fire patrol, fire supervision, forestry mapping and other minor uses, recommended at the end of the 1924 season that radio communication from machines and sub-bases to Sioux Lookout, and from Sioux Lookout to rangers, would be of the greatest value in this region, and if proper equipment could be procured, it should be provided in the coming season. Experimentation commenced that winter, but it was not until 1926 that a radio service had been installed. The radio sets were designed, engineered and built by the Department. This was the start of a radio communication system which not only rendered valuable service to the Department, but was also used to great advantage by the mining interests in the considerable development in that area which followed shortly.

While, in this first year of operation, the greater portion of flying time was devoted to fire patrol, a limited amount of time was allotted to fire-fighting, sketching and photography.

Men of the P. A. S.

In addition to the Director, Roy Maxwell, the original pilots in the Provincial Air Service included G. A. (Tommy) Thompson, Terry B. Tully, Fred J. (Steve) Stevenson, J. Clarke Ruse, J. R. (Rod) Ross, H. A. (Doc) Oakes, Romeo Vachon, W. H. (Hec) Ptolemy, R. Carter Guest, C. J. (Doc) Clayton, Leigh Brintnell, Ed. C. Burton, C. A. (Duke) Schiller, P. J. (Pat) Moloney, J. O. (Jack) Leach, and H. C. Foley. Famous names, many of these, in the history and development of Canadian aviation. Of these, but four have lost

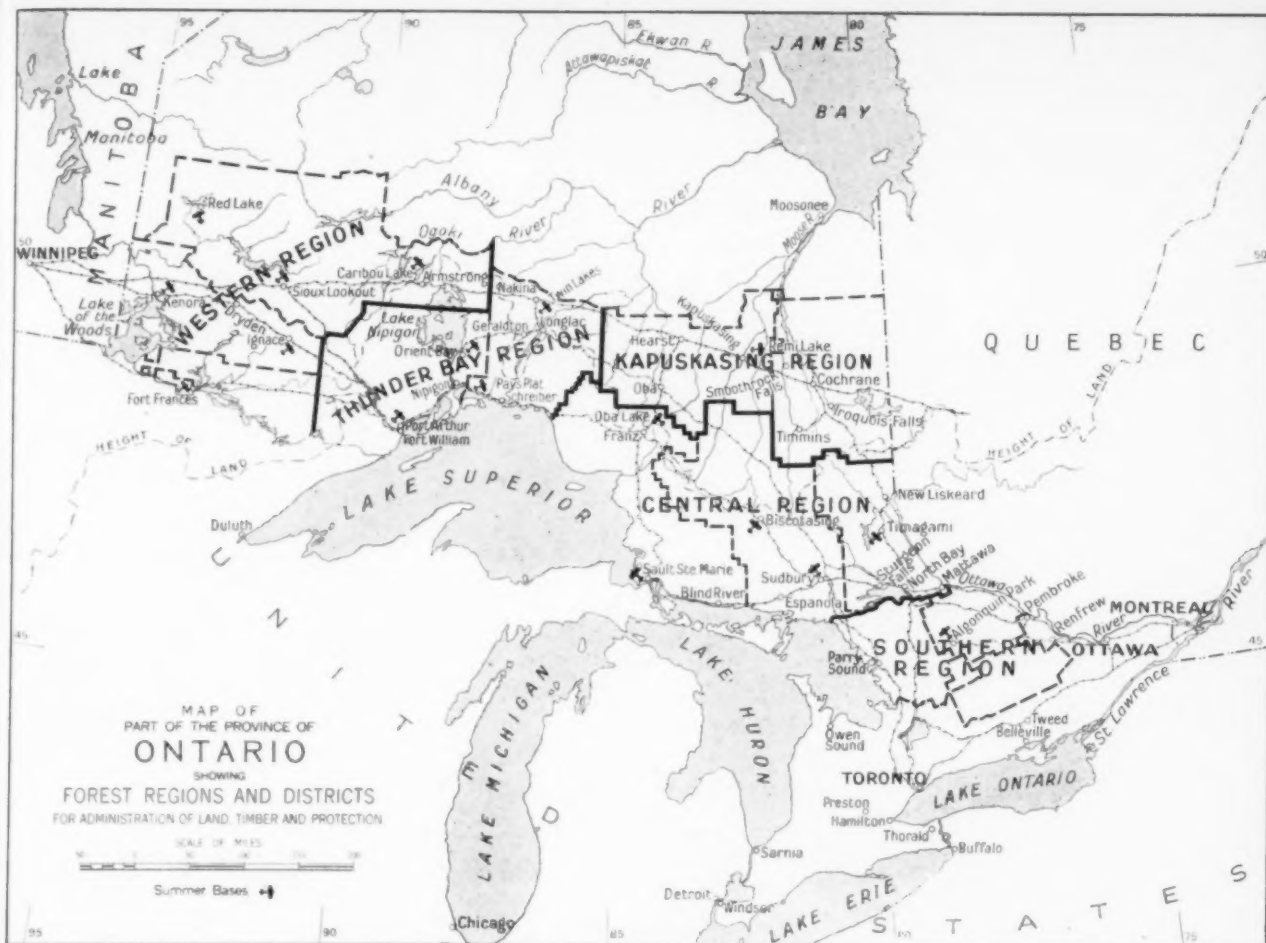
their lives, and only one in the Provincial Service. The famous Major Jack Leach, one-legged, ace R.F.C. pilot of World War I, with M. C. and Bar, lost his life flying a Hamilton all-metal seaplane over Thunder Bay. Captain Terry Tully, famous instructor at the Gosport School of Special Flying in England, was lost while attempting to fly the Atlantic in 1927 (Lindbergh year) in one of the first Stinson models. Capt. "Steve" Stevenson, another war ace, who saw service in Russia as well as France, had his fatal crash at La Pas, Manitoba. Stevenson Field, the T.C.A. landing field at Winnipeg bears his name. "Duke" Schiller, whose flying exploits were known throughout the world, was killed in 1943 in a crash landing in Bermuda waters while with the Ferry Command.

World War II had barely started when a number of members of the P.A.S. answered the call of their King and country. These included such stalwarts as Flt. Lt. Mac Hallatt, Sqdr. Ldr. George Phillips, Acting Wing Cmdr. Joe Heaven, Flt. Lt. Carl Crossley and Wing Cmdr. Jim Phillips.

Former pilots of the P.A.S. who entered war service include Wing Cmdr. Bill Chapman, Acting Wing Cmdr. Roy Maxwell, Sqdr. Ldr. Jock Jarvis, Flt. Lt. Al Cheeseman and Flt. Lt. Phil Sauve, all of the R.C.A.F. Eddie Waller is with the United States Army Air Force. "Duke" Schiller and H.C.W. Smith were with the Ferry Command until their accidental deaths. Other pilots, whose names cannot be readily recalled, rendered valuable war service.

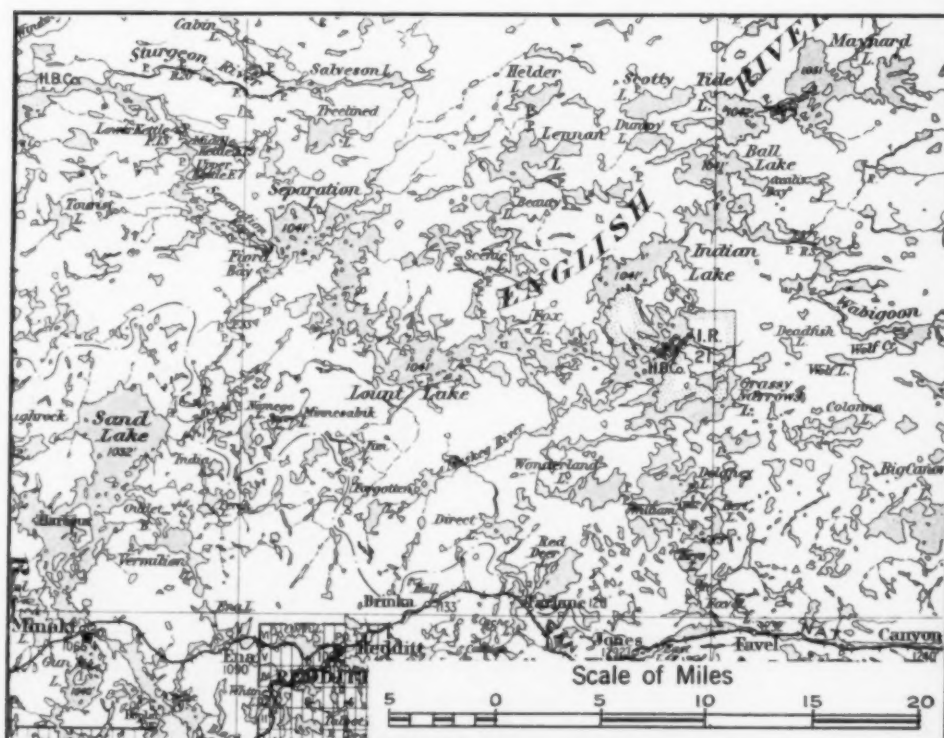
Foremost Air Engineer to enrol as a member of the original mechanical staff in 1924 was Jack Hyde. Jack emerged from World War I as a Sergeant aircraft rigger. He was a cabinet maker by trade and a graduate of the "Old School". His skill and energy soon earned him the position of Superintendent of maintenance and reconditioning. His initiation and devotion to duty helped mould the mechanical staff of the Service into an efficient force. His staff of talent included Tommy Siers, W.G. Chapman, George Doan, S. Macauley, Gordon Hutt, H. J. Phillips, J. Sherbourne, S. A. Rouse, J. M. Clark, A. H. Simard, S. Tomlinson, R. R. Fraser and A. E. Hutt.

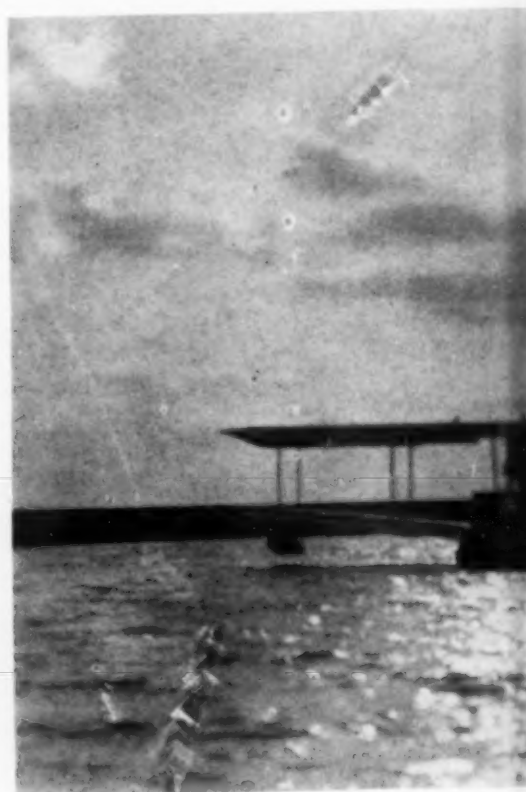
As commercial flying progressed in the Dominion, organizing executives wisely offered senior positions to pioneer pilots and engineers of the Provincial Air Service. This Service, with no pool of experienced personnel from which to draw, found it necessary to establish a school of flying



C. G. J. map

Typical section of lake-dotted Northern Ontario — which provides thousands of natural landing areas for aircraft.





Above:—Fairchild 71

REPRESENTATIVE TYPES OF AIRCRAFT

Top:—A Waco at Ramsay Lake base,
1944

Top centre:—Noorduyn Norseman
delivered in 1944.

Right:—Moth at beach near Kenora





Above:—Buhl aircraft

NOW IN USE BY THE P.A.S.

Top:—Hamilton all-metal transport

Centre:—Vickers Vedette Amphibian
used extensively in photographic and
sketching programmes.

Left:—Gipsy Moth



Remi Lake base

designed to provide a flying staff trained from the ground up in the particular requirements of forestry work. A benefit of the school was the encouragement given mechanical personnel, through their valuable efforts and ability as engineers, to promotion to flying classes in the school. Pupils were also selected from the observing staff of the Forestry Branch. The school is recognized as the cradle of the "bush pilot"—who ranks with the best in the business in flying ability.

The following now famous pilots are graduates of the Bush Pilot School — George Phillips, Bob Smith, Al Cheeseman, Gifford Swartman, Pat Reid, Ed Ahr, Pat Twist, Eric Billington, Keith Murray, Tom Mahon and Jack Herald.

Development of the P.A.S.— Supply of Aircraft

A review of the problems of the P.A.S. in securing aircraft which would best meet the needs of the Department makes interesting reading, not only as part of the record of aviation as applied to forestry, but also because it reflects, to some extent, the history of commercial aviation in general from its formative stages to the present.

As mentioned previously, the nearest

* Seaplanes are distinguished from flying boats by the fact that they are equipped with floats.

Pumping up float at an air base.



Relaunching aircraft at

base at

thing to an aircraft suitable to forestry work at the time of organization of the P.A.S. was the HS2L flying boat which had been used by the United States Navy. Starting in 1924 with 14 of these large machines of limited carrying capacity, with an original conception that they were to be used primarily for fire detection, the years that followed had many vicissitudes, with the advent of later models of aircraft and new conceptions as to their use. It has been necessary in the past, and will be in the future, to adopt a fluid policy of operation, as new factors and conditions always arise.

Experience gained in the first and next few years of operation indicated that aircraft were suitable for fire suppression as well as detection, and the HS2L's and the two Loening Air Yachts, also Liberty-powered flying boats, purchased in 1926, were called upon to do more and more transportation work in connection with suppression.

In 1927, the Service purchased four Moth seaplanes*, powered with Cirrus

Engineer refuelling ship. Note canoe strapped to float, ready for transportation.





craft at
base after minor repairs.

Mark II engines of 80 H.P. These planes were intended for detection patrol only, thereby liberating the HS2L's for an extra chore of suppression transport work. The Moths were the first light aeroplanes fitted with floats, and the fact that they were first supplied to and used by the P.A.S. marked the year as an epoch, not only for the Service, but for aviation throughout the world. Credit is due the Service, which maintained that with slight modifications, the original land plane could be converted into a serviceable seaplane. The success of the Moths vindicated the venture, much to the satisfaction of the manufacturers, the De Havilland Co. of England, who had had misgivings.

In 1928 the P.A.S. stepped into the transport field by the purchase of a De Havilland 61 float seaplane, powered with a Bristol Jupiter engine of 500 H.P. The usefulness of this type of machine was apparent at once, as it was capable of carrying a fire-fighting crew of eight men with pumps and equipment. In this same year five more Moths were added to the fleet. By this time the Moths were



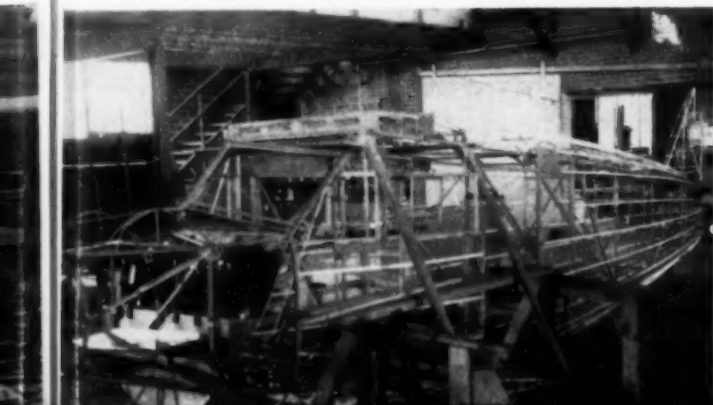
An air base in the Far North

doing most of the detection work and the HS2L's were being detailed more and more to suppression. Even the little Moths, however, were being called upon to carry suppression loads, as the demands for this type of work was ever on the increase.

The year 1929 was marked by many modifications of aircraft to meet the demands upon them. A Pratt & Whitney air-cooled engine of 525 H.P. was installed in the DH-61, and the 80 H.P. Cirrus engines in the Moths were replaced by 100 H.P. Gipsies. The Service added a Vickers' Vedette Amphibian to its fleet, for photographic purposes, in this season. The Director of the Service, in his report for the year, stated that, "The day of the flying boat as an economical means of transportation in this Service is past". However, twelve HS2L's were still in operation.

In 1930, four new all-metal Hamilton seaplanes, powered with Pratt & Whitney Hornet 575 H.P. engines, were introduced into the Service. These new machines impressed the members of the Service by their "... clean-cut, stream-lined appearance, high speed (120 m.p.h.) and high pay-load (1,500 pounds)". The pilots and air-engineers, as well as the District Foresters who requisitioned the flying, saw in the Hamilton a machine which

Buhl under construction in the Soo Hangar workshop, 1936



would really prove satisfactory for transportation and suppression work. Six HS2L's had been scrapped in the previous winter, and the complement of 28 aircraft was then made up of the 4 new Hamiltons, a DH-61, a balance of 6 HS2L's, 14 Moths and a Vedette. This gave the Service for its fifteen bases a transport section of 5 ships, a detection section of 14 and a detection-suppression section of 6, with the Vedette ear-marked for photography. The transport planes were all allocated to the Western Division where they were most needed, and where HS2L's were filling in until additional transports could be purchased. The Eastern Division had to be content with Moths which did both detection and suppression work, aided by 2 HS2L's at the northwestern end of the Division.

In 1931 the Service added a Fairchild 71, with a B Wasp engine, to its transports, and also purchased a Fairchild KR34, having a 165 H.P. Wright engine, to meet the special requirements of the flying superintendent of Algonquin Park.

Two Fairchild 71-C transports and another DH-61 were put into service in 1932. The number of HS2L's was by then reduced to four. In the winter of 1932-33 Federal regulations governing obsolescent aircraft forced the retirement of the balance of these flying boats.

Outside of the KR34 and the Vedette, the Service started out the 1933 season with a clear-cut division of its fleet into a transport section of 6 and a detection

section of 14 machines. In this season two of the Moths were fitted with the new-type Edo floats and equipped with Gipsy Mark II engines. The Vedette was equipped with the latest Wasp Junior 300 H.P. motor.

Roy Maxwell guided the destinies of the P.A.S. until 1934, when George Ponsford, well known in United States and Canadian aviation circles, took charge.

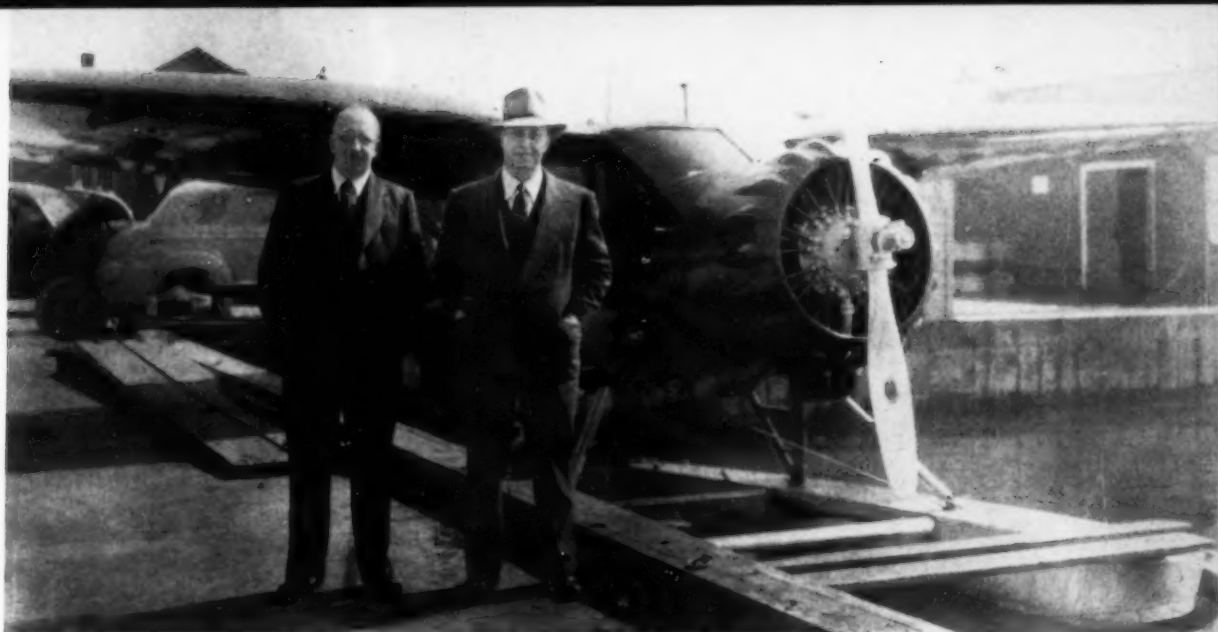
By 1935 pilots and foresters alike decided that the Service should be furnished with a type of aircraft having a pay-load of from 850 to 1,000 pounds, the weight of a complete initial fire-fighting crew and equipment. This ship was intended to be sufficiently economical in operation to be useful for either detection or suppression, or a combination of both. The P.A.S. acquired the sole rights from the Buhl Bros. to manufacture Buhl CA-6 aircraft and undertook to build four of them at the Soo Hangar. In the 1936 season two of the Buhls were in operation, powered with P. & W. Wasp 440 H.P. engines. In this season of abnormally high fire hazard it was found necessary to purchase \$90,000 worth of additional flying from outside sources. In 1937 two more Buhls, built by the Service, were put into commission, and two Stinson SR9 seaplanes, with P. & W. 440 H.P. Wasp engines, were purchased. These Stinsons, which were dual-purpose machines like the Buhls, were built essentially to P.A.S. specifications. In 1938, four more Stinson SR9's were purchased.

Since the commencement of war the P.A.S. has not pressed the over-loaded aircraft industry for new aircraft, as the Service realized that military machines were of far greater importance. In 1940 two second-hand Stinsons and a used Vedette flying boat were added; in 1941 two more Stinsons; in 1943 a used dual-purpose Waco with a 330 H.P. Jacobs engine, and in 1944 another used Stinson. Thus the programme of purchasing dual-purpose machines had continued so that in the present year the Service has a complement of 13 of this type of ship.

In 1944, through an unexpected easing of the tight situation in aircraft supply by the Department of Munitions and Supply, the P.A.S. was able to purchase



Moth on new type of skis of P.A.S. design; George Phillips at right



George Ponsford (right) and Jack Hyde (left) on the Soo Hangar slipway, 1944

four new Noordyn Norsemen, powered with 550 H.P. Wasp engines. These were the first of the heavier transport-type aircraft acquired by the Service in twelve years. Upon acquisition of the Norsemen, the two remaining Hamiltons, having lived out their useful life, were retired from service.

The above complement of aircraft gives the Service 5 transports, 14 semi-transports and 6 detection machines. The present trend is toward replacing the balance of the old Moth detection machines with semi-transports.

Aircraft Maintenance

In order to operate an air service, there is more to do than provide pilots, engineers, bases, gas and oil. A major function is to maintain the aircraft to definite standards of airworthiness, not only to meet the requirements of the P.A.S. but also those of the Dominion Government which makes the official certification. During the summer season minor repairs and general maintenance are looked after by the air-engineers at the various field bases, some of which are at outpost points. Each year, about the last week in October, all machines are returned to the Soo Hangar where they are completely dismantled. This applies not only to airframes, but also to engines, propellers, instruments, floats and all other component parts. Each part is thoroughly cleaned and inspected, and replacements are made if there is evidence to indicate that this is needed. After overhaul the engines are re-assembled, run and tested

until they conform to the standards of airworthiness of the Service, after which they are installed in the reconditioned airframes.

The large Soo Hangar is admirably equipped to supply the utmost in thorough, complete inspection and repair of component parts. As new and more accurate equipment becomes available, it is acquired as a matter of policy. In the words of Mr. George Ponsford, Director of the P.A.S., "On many occasions special problems have challenged the ingenuity and resourcefulness of our staff, but I do not know of any occasion on which they have failed to accept the challenge and whip the problem".

In addition to Jack Hyde, the plant superintendent whose superior craftsmanship has already been mentioned, there are many members of the mechanical and engineering staff whose ingenuity and colour have added to the prestige of the Service.

To cite one example, George Doan, who has been with the P.A.S. since its inception, was one of the old time dare-devils of the air, thrilling thousands with his wing-walking and parachute jumping when it was just about an even bet that the wing would not take the weight or the parachute would not open. He almost drowned one time before thousands of thrill-seekers in Hamilton Bay due to the fouling of the chute cords. George is still at the Soo Hangar, but he stays on the ground now. Any pilot may be sure that when a plane leaves George's hands it will be "right".



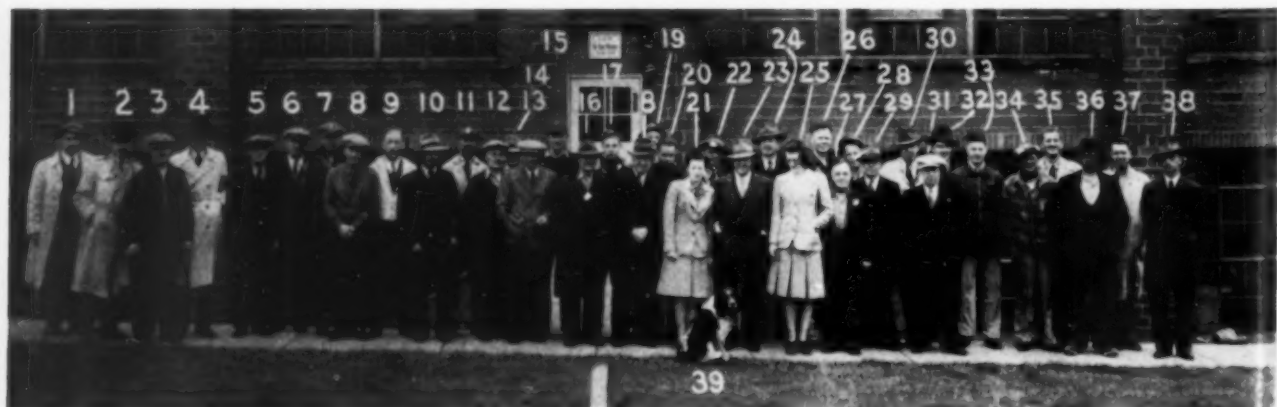
PILOTS

1 - Yerkki Fiskar 2 - Verne Gillard 3 - Grant Denley 4 - Louis Poulin 5 - George Charity 6 - Doug Cameron 7 - J. T. Pipe 8 - Chas. LeFeuvre 9 - Jake Siegel 10 - Winston Buckworth 11 - Art Burt 12 - Geo. Trussler 13 - Clifford Peene 14 - Ed Hurton 15 - Tom Woodside 16 - Jim Kincaid
Not included in photograph: — J. M. Taylor, R. Parsons, C. MacMillan, A. B. Smith, and C. C. Crossley.



AIR MECHANICS

1 - Dick Fraser 2 - Dave Fleming 3 - Ernie Wright 4 - Lyall Johnson 5 - Jim Fox 6 - Hugh Allison 7 - Clarence Holmberg 8 - Bud Elliott 9 - Glen Parrott 10 - Jeff Robinson 11 - Walter Davidson 12 - Earl Hodgson 13 - Lloyd Hill 14 - George Dean. Not listed in photograph: — R. C. Allen, D. Walker, G. Larry, W. McCarthy, P. Parr, L. Failes, J. M. Clark, and J. E. R. Sinaré.



P. A. S. STAFF IN FRONT OF SAULT STE. MARIE HANGAR, 1944 (including some of the pilots and air engineers about to leave for northern bases).
1 - Yerkki Fiskar 2 - Ernie Drew 3 - Geo. Miles 4 - Verne Gillard 5 - Percy Hancock 6 - Dick Fraser 7 - Dave Fleming 8 - Geo. Gill 9 - Tom Woodside 10 - Ernie Wright 11 - Lyall Johnson 12 - Jim Hendry 13 - Clifford Peene 14 - Jim Fox 15 - Hugh Allison 16 - Bill Wilcox 17 - Clarence Holmberg 18 - Jack Hyde 19 - Sam Macauley 20 - Bud Elliott 21 - Joan Moor 22 - Art Denning 23 - Geo. Pensford 24 - Winston Buckworth 25 - Betty Carmichael 26 - Jeff Robinson 27 - Bill Murray 28 - Walter Davidson 29 - Don Kraushaar 30 - Earl Hodgson 31 - Art Read 32 - Glen Parrott 33 - Lloyd Hill 34 - Geo. Dean 35 - Doug Cameron 36 - Walter Christensen 37 - Louis Poulin 38 - Cliff Noble 39 - "Boots"

Then there was the late Bill Hill, who died at his machine in the hangar not long ago. Right now, one of Bill's inventions is a little machine which is awaiting patent. Details are secret, but it is expected to do big things in the aviation field. One day when Bill was *en route* to Fort Smith in the McKenzie River district, the plane came down to a landing on an ice-covered lake across which ran a dog-trail with dry, hard-packed banks. The plane hit the banks and the propeller was shattered. Bill salvaged half of the broken propeller, used it for a model, and carved a new one from some oak planking, obtaining the necessary glue from moose hooves. The propeller was laminated and tested. They took off, flew home, and the propeller is now in a Canadian museum.

The "hangar gang" are not good with aeroplanes only, though. George Ponsford lists a few samples of their spare-time work at the Soo, in the following statement: "I find we have built one cruiser 38 feet 9 inches long for Lac Seul; one for the Sudbury district, 31 feet 7 inches; one for Ranger Lake, 25 feet 6 inches; one large cabin cruiser, Diesel powered, 59 feet 5 inches and weighing 26½ tons, at present at Pays Plat; 110 sectional canoes; 19 collapsible canoes; 8 split canoes; 33 ordinary double enders and 20 of the square stern freighter type which we designed here. In addition, we have built nine Clinker-built boats and two scows for transportation of gasoline supplies.

"For years, this Service built for its own requirements aircraft skis of its own design. At the outbreak of war, the National Research Council endeavoured to find the best type of ski for use on high speed military aircraft. They invited all users and makers of skis in Canada to submit one of their design so that they might be tested to find the ski with the least drag and pitching moment. The ski designed by the Service proved far superior to the others when tested in these two respects.

"The Service also designed and built a cylinder lapping and honing machine for reconditioning aircraft engine cylinders, and we have also designed and built many special tools for use in engine and propeller reconditioning and overhauling."

And to go a little farther, the Service designed its own system for heat circulation and humidification, which has saved many hundreds of dollars on the coal bills.

The Varied Work of the Service

As the chief function of the Service has been to supply air transportation for forest fire protection, the degree of fire hazard has had a pronounced effect upon the activity of the Service. In a normal season the basic amount of flying has been about 5,000 hours.

In addition to the air patrols for the detection of forest fires, and fire suppression, which consists of all flying directly connected with and required by forest fires, including location and extent, transportation to and from, and sketching of the fire area, there are many other duties in the Service. These include the following:

Transportation—Ordinary

General Administration Service—all flying in connection with the administration of Forest Protection, Timber Management and Lands Management.

Particular Services in:

Game Detection—all flying that is carried out for the purpose of preventing poaching in our game preserves.

Photography—if not exclusively for the Air Service.

Sketching—all flying required to sketch spruce budworm infection, white pine needle blight, and damage from sulphur fumes, etc.

Dusting—all flying incurred in insect dusting.

Wireless Tests—if not exclusively for the Air Service.

Radio Tests—if not exclusively for the Air Service.

Observers' Instruction—all flying required for the purpose of training observers for fire detection, etc.

Transportation—Special

General Transportation Service—revenue producing flying that is carried out for other Departments, commercial lumber operators, etc., and includes—

Mercy Flights—all flying of an emergency nature occasioned by sickness or accident, where commercial aircraft are not available.

Operations

General Operations Service—all flying required by the Air Service in order to maintain the above services, and includes—

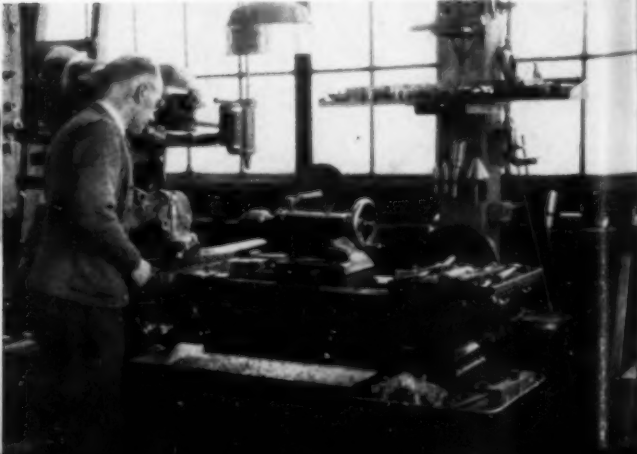
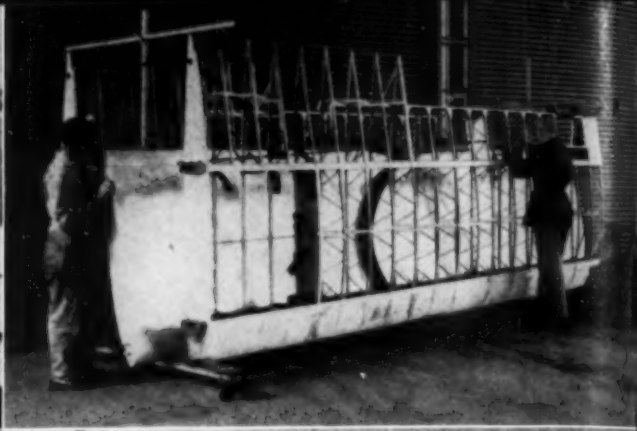
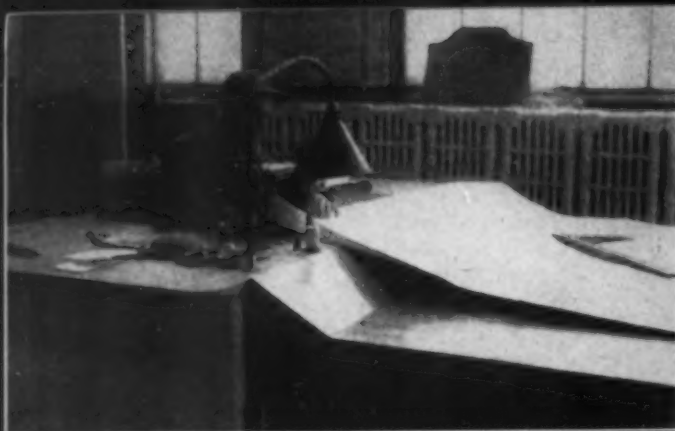
Particular Service for:

Ferrying—all flying required in moving aircraft from one base to another for repairs, opening and closing bases, etc.

Forced Landings—all flying incurred by forced landings.

Flying Instructions—all flying required for the purpose of training and refreshing personnel in their duties.

Aircraft Tests—all flying required for the proper test flying of the Department's Aircraft.



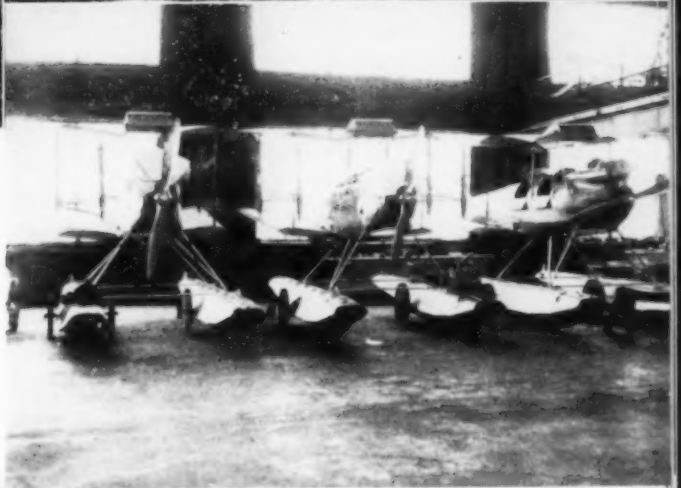
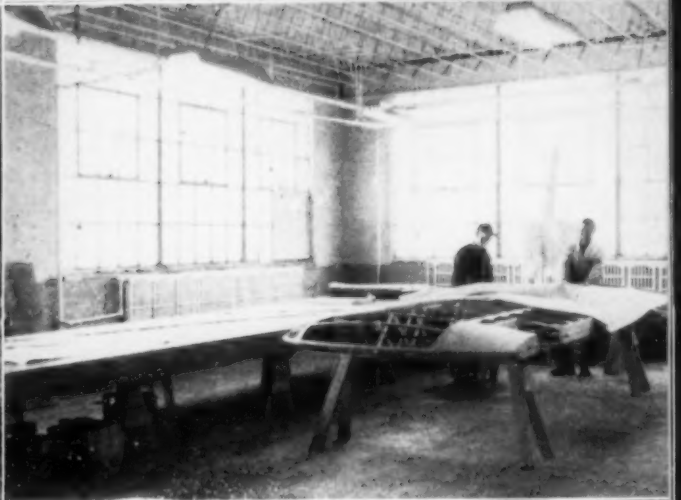
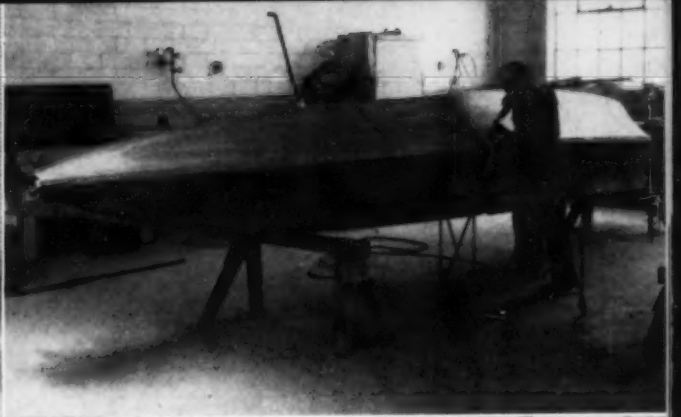
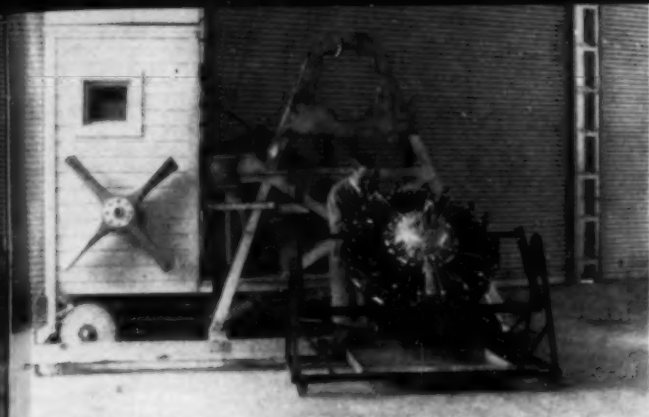
SCENES AT THE SOO HANGAR

Left, top to bottom:—
Preparing wing covers in the fabric department.
Carpentry shop

Starting out for bases from the Soo Hangar, 1944.
Pilots, air engineers, and their families prepare to
depart from the Soo base for their bases of summer
operations.

Top right:—Storing a wing awaiting inspection and repair.
Centre:—Air view showing P.A.S. hangar and environs
at Sault Ste. Marie.

Below:—Part of the machine shop



HANGAR, 1944

At top:—Portable engine-test stand

Right, top to bottom:—
Repairing a float.

Covering an aircraft wing.

Three Moths of the detection fleet

A number of aircraft on the assembly floor

Below:—Dismantling and reconditioning a Wasp engine.



A record of the hours flown on various phases of flying operations from the date of the inauguration of the Service until March 31st, 1943, is given below:

	1924-42	1942-43	Total
Fire Detection.....	39,519	855	40,374
Fire Suppression.....	32,370	743	33,114
Transportation—Ordinary			
General Administration Service.....	27,700	1,853	29,553
Particular Services in:			
Game Detection.....	196	4	200
Photography.....	1,375	10	1,385
Sketching.....	3,496	23	3,520
Dusting.....	41	41
Wireless Tests.....	69	69
Radio Tests.....	8	8
Observers' Instruction.....	94	94
Transportation—Special			
General Transportation Service.....	5,593	256	5,849
Particular Transportation Service			
Mercy Flights.....	217	22	240
Operations			
General Operations Service.....	5,078	94	5,172
Particular Service for:			
Ferrying.....	5,338	215	5,553
Forced Landings.....	864	6	871
Flying Instruction.....	2,887	43	2,930
Aircraft Tests.....	1,358	38	1,396
Totals.....	126,211	4,166	130,378

A summary of flying statistics follows:

	Average 1924-42	1942-43	Total
Number Passengers Carried.....	71,857	6,232	78,089
Number Personnel Carried.....	65,622	2,487	68,109
Total Number Passengers and Personnel Carried.....	137,479	8,719	146,198
Miles Flown.....	8,759,529	383,086	9,142,615
Effective Loads Flown—Lbs.....	29,243,537	1,713,197	30,956,734
Effective Loads Flown—Tons.....	14,621 Tons	856 Tons	15,478 Tons
	1,537 Lbs.	1,197 Lbs.	734 Lbs.

The allocation of aircraft and personnel to summer bases in August, 1944, was as follows:

Base	Aircraft	Registration	Pilot	Engineer
Algonquin Park	Stinson	CF-OAX	Taylor, J. M.	Allen, R. C.
	Moth	G-CAPB		
Biscotasing	Norseman	CF-OBF	Parsons, R.	Walker, D.
Caribou Lake	Buhl	CF-OAS	Pipe, J. T.	Hill, L.
Fort Frances	Stinson	CF-BGM	Burt, A. E.	Robinson, G.
Ignace	Stinson	CF-OAV	Cameron, R. D.	Larry, G.
Kenora	Norseman	CF-OBD	Peene, C. S.	Davidson, W.
Oba Lake	Buhl	CF-OAR	Siegel, J.	Hodgson, E.
Oba Lake	Moth	G-CAOZ	Denley, G.	
Orient Bay	Fairchild 71-C	CF-OAP	Burton, E. C.	Fleming, D.
Pays Plat	Stinson	CF-OAW	MacMillan, C.	McCarthy, W.
Port Arthur	Norseman	CF-OBE	Buckworth, W. B.	Parr, P.
Red Lake	Stinson	CF-BGN	Poulin, L. D.	Johnson, L.
Remi Lake	Stinson	CF-BGJ	LeFeuvre, C. J.	Parrott, G.
Sault Ste. Marie	Stinson	CF-OBA	Woodside, T.	Allison, H.
Sioux Lookout	Norseman	CF-OBC	Gillard, M. V.	Doan, G.
	Stinson	CF-OBG	Trussler, G.	Wright, E.
	Moth	G-CAPA		Failes, L.
Sudbury	Waco	CF-BDQ	Smith, A. B.	Fox, J.
Timagami	Stinson	CF-OAY	Crossley, C. C.	Clark, J. M.
Twin Lakes	Moth	CF-OAA	Kincaid, J.	Simard, J. E. R.
	Buhl	CF-OAQ	Charity, G.	Elliott, B.
	Moth	G-CAOU	Fiskar, U. W.	Holmberg, C.

Aircraft at Sault Ste. Marie main hangar

Moth	G-CAOW	(Spare)
Stinson	CF-BIM	(Spare)

Adventure

P.A.S. pilots were in the public eye in the early 1920's and subsequent years with their adventurous flights. Roy Maxwell made many historic flights, including the one in which he flew the first doctor to Moosonee, on James Bay; Al Cheeseman went to the Antarctic with Sir Hubert Wilkins, being especially chosen because of his northern flying experience; Cheeseman also helped Pat Reid, 1944 McKee Trophy winner, search for a party of Russian fliers in Alaska; "Duke" Schiller, who was considered one of the greatest fliers of his time made many adventurous flights; "Giff" Swartman, who became known as an "Arctic flier". "Giff", with Sam McCauley, Bill Hughes and Doc Oakes went looking for Carl Ben Eilson in Alaska and found the missing party.

You have doubtless read newspaper accounts of a Service plane bringing a sick man, woman or child out of the bush for medical aid. It has happened a 100 times in the last 20 years. Here are extracts from just two letters received by Mr. Ponsford this year:

"I was told by the doctor that your prompt action in connection with the plane has saved this man's life. You will get satisfaction out of knowing that and we wish to thank you on behalf of the man and our company."

"Please accept my grateful appreciation of your prompt and effective action at my request to have a sick man moved from our camp to Port Arthur . . . The man has a ruptured appendix and was operated upon on arrival."

Some of the "mercy flights" presented real difficulties. Take, for example, the Moose River mine disaster, when the whole world listened with bated breath to the plight of three men trapped in a Nova Scotia mine. Two were still alive when taken out days later; one had died. While they were entombed, miners worked night and day to sink a narrow shaft to the level in which they were trapped. The then-Premier Mitchell F. Hepburn offered the use of the Ontario Service in any capacity and the offer was accepted. The first ship, a DH-61, piloted by George

H. R. Phillips, left the Soo on April 16. Phillips carried with him a small microphone which, it was hoped, could be lowered to the entrapped men. The second ship, a Vickers Vedette, piloted by A. C. (Joe) Heaven left on April 25. It carried a special type of wool which, it was hoped, could be packed in the clothing of the buried men to provide added warmth.

Mr. Ponsford's laconic report on this operation reads as follows: "April 16 to 25 is the break-up period but by reason of the current in the St. Mary's River and the Service being located here at Sault Ste. Marie, we have open water much earlier than in any other part of Northern Ontario. By this time of the year we usually have many of our ships reassembled and ready for testing as soon as ice conditions in the river permit. When this emergency call reached us, we immediately put the DH-61 in the water, completed its test flying and it was off for Toronto the same day. Phillips, I believe, had to dodge floating ice in order to carry out his test flight and subsequent take-off."

When, a few days later, the second call came for another ship, we were not so fortunate. We had nothing actually ready, but we put a crew at work day and night until the Vedette was finally ready. Heaven also had to dodge ice in getting under way.

Neither Phillips nor Heaven ever mentioned, for publication, that after reaching Toronto they took a "dry hop" across part of the New England States, over unfamiliar territory, in weather "which saw the ducks walking". The rescue job over, they turned about and made the 1,400-mile trip back to the Soo without mishap.

The trouble is, from a journalistic point of view, pilots just will not talk about

A section of Northern Ontario as seen from above the clouds.





First doctor and nurse flown (by Roy Maxwell) into Moose Factory, James Bay, for the Department of Health.

"mercy flights". For instance, no one has ever persuaded Pilot Eddie Waller to tell the story of his flight from Fort Hope on the Albany River, to Sioux Lookout. All he ever recorded in his log was: "Demented Indian, flown Fort Hope to Sioux Lookout".

Since the outbreak of war the Service has co-operated with the R.C.A.F. on many occasions. One assistance rendered has been the locating of young R.C.A.F. pilots who strayed from their courses and landed in isolated places. In one case the Service salvaged an R.C.A.F. Anson which got off its course and force-landed, out of gas, in a small swampy lake near Fort Hope—130 miles north of civilization. The R.C.A.F. requested the aid of the pilot in locating and bringing in the crew, as well as to investigate the possibilities of salvaging the Anson. Two P.A.S. pilots, "Yorky" Fiskar and Colin MacMillan, with their aircraft, were allocated to this job. They picked up all necessary equipment, including a light winch borrowed from a gold mine, and proceeded to Fort Hope.

They searched for and found the fliers, after which they investigated the salvage proposition. They enlisted the services of several Indians, and landed on a lake near that on which the Anson was down.

Arriving at the scene, they built a floating dock from the shore of the muskeg lake to the wrecked machine. This dock was built by cutting down trees, sinking them to the bottom of the lake, and building a deep mat of brush over this base, on which they laid more trees for a top surface.

This dock, or bridge, had to be able to support the load which would be imposed on it. A gin-pole was erected at the end of the "dock" and the aircraft was heaved up on to it. Out of the ship came the twin motors, carburettors, radios, tools, cables, control system, instrument panels, and, in fact, everything movable. As the heavier parts of the aircraft were removed the "dock" rose higher and higher in the water. Finally, all material of value was salvaged and nothing was left of the ship but the airframe itself. This was considered the most complete salvage operation ever conducted in Northern Ontario.

Dividends

In fire protection alone the P.A.S. has paid big dividends in service on the investment of the People in this organization. Take the year 1923. That was the worst fire year on record, with 2,000,000 acres burned over. The Service was too young to do much about it then. Equipment and improvements cost \$118,775, operating cost was \$87,994. Forestry experts say if the Service had had 100 planes and 10 times as much equipment it could not have wholly suppressed the fires of 1923, but they also point out the cost of equipment could not be compared with the value of 2,000,000 burned acres.

The next big test came in 1936 when a total number of 2,264 fires were fought. Total acreage burned over was 1,264,433 with 80 per cent of the fires in one month—July. Lightning was responsible for 78.9 per cent, and consequently flying conditions were not good because of the storms.

That year, fliers climbed in and out of their machines, their faces black with smoke and eyes red-rimmed. Some of them averaged around 12 or 13 hours' flying a day, rushing men and equipment through the North.

Let us take the cold, official wording of the Departmental report for that season:



"In the matter of size of individual fires, 20.2 per cent did not reach an area of more than $\frac{1}{4}$ acre. Another 36.2 per cent was confined to areas of five acres and under, and another 27 per cent to areas of 100 acres and under; 6.7 per cent reached areas of over 1,000 acres." The effectiveness of the Service was well demonstrated during this period—one of the worst fire years Ontario has ever known. The P.A.S. will continue to contribute its share in the preservation of Ontario's great forest resources.

As an extension of the health service in Northern Ontario, Dr. R. P. Vivian, Minister of Health, announced this year a flying ambulance service for patients requiring prompt hospital attention. Planes will be available for the provincial service and physicians located at various strategic points in the North will pass judgment on the need for planes in cases brought to their attention.

"I am sure this evidence of government interest in the welfare of those on the northern fringe of Ontario will be much appreciated by those affected", Dr. Vivian said.

As the planes of the future continue to open new avenues of travel in Northern Ontario and thereby lessen the problems of transportation in the great expanses of that territory, their pilots will perhaps sometimes recall memories of their earlier pioneering brothers of the Provincial Air Service whose H-boats and Moths cast the shadows of their wings over the bush.

SALVAGE OPERATIONS

Top to bottom:—An Anson beached in Swamp Lake.

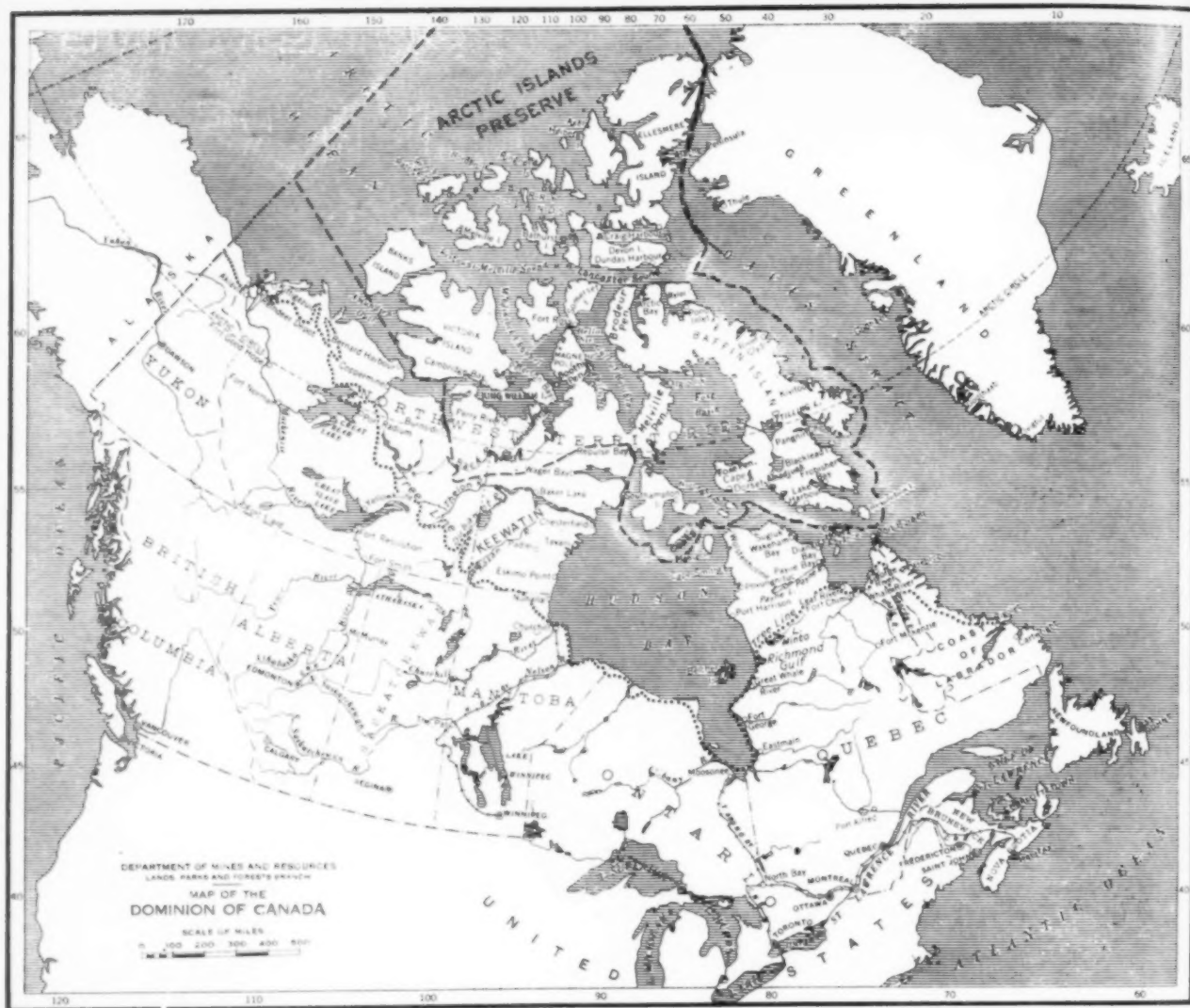
Close-up of conditions before salvage operations
Anson is lifted.

Log and brush dock improvised by salvage crew.

Left:—Some of the parts salvaged.

Below:—Carrying salvaged parts inland.





ECONOMIC WILDLIFE OF CANADA'S EASTERN ARCTIC—CARIBOU

by J. G. WRIGHT

THE Eastern Arctic might be defined as those sections of Canada's Arctic regions most readily serviced from the Atlantic approach. It comprises the area between the Labrador boundary on the east to the west boundary of the District of Keewatin (Long. 102°) on the west and the islands lying generally north of this.

An Arctic region is defined as one where the mean temperature for the warmest summer month is less than 50° F. This temperature boundary coincides in a fairly

general way with the northern limit of forest growth, or the "tree-line", as it is usually called. North of this line open field agriculture is not possible. At a few points small quantities of vegetables are raised under glass, but, for all practical purposes, the residents of the Arctic regions must depend upon imported food-stuffs or upon the animal foods found in the country. To the natives, animals provide not only the food necessary to sustain life, but in many cases the clothing

most suitable to withstand the rigours of the northern winters. In most cases, too, through the fur trade, animals provide the only source of income available to the native with which to purchase outside food-stuffs, ammunition, and equipment upon which he now depends for his continued existence. The fur trade is the only industry of present consequence and it can exist only where there are sufficient fur-bearing animals, and healthy natives to harvest the crop. The welfare of all human activity in the North is, therefore, specially dependent upon the welfare and abundance of the wildlife in the region. The conservation of wildlife consequently assumes a very important place in the administration of our Arctic regions, and all attempts to exploit these resources must be carefully scrutinized.

The Northwest Game Act and Regulations made thereunder provide for the conservation of game for the benefit of the native population, and regulate the establishment and location of trading posts. Hunting and trapping licences are issued only to residents, but native-born Indians, Eskimo, and half-breeds do not require licences. Trading permits are issued only when it is considered in the interest of the native or other residents to do so. Game preserves have been created in which only native-born Indians, Eskimo and half-breeds may hunt and trap. The Arctic Islands Preserve includes a large part of the Eastern Arctic region as shown on the accompanying map. The Game Regulations fix close seasons; provide for the issuance of licences to carry on fur-farming and the taking of game animals for propagation and scientific or other purposes, and otherwise regulate the game resources of the region in the interest of ensuring a continuing supply for the natives.

The following discussion does not purport to be a technical treatise on the animal life of the region, but is rather an attempt to trace the influence of certain fauna and their exploitation upon the economic life of the natives. Many Arctic animals fluctuate greatly in numbers from year to year and some of these fluctuations follow regular cycles. Some are subject to migratory habits so that in a given locality they may be plentiful at one season and almost entirely absent at

others. All these and other factors of animal life tending to influence human activity are set forth briefly. Any one desiring to pursue more detailed studies on any phase may consult the bibliography on page 195.

Barren Ground Caribou

The barren ground caribou is one of the most important animals in the North. No satisfactory substitute for its skin has been found for the manufacture of winter clothing because of its strength, lightness and the insulating value of the hair, which consists of thin-walled hollow tubes. Where caribou skins are not available the Eskimo are poorly clothed with possible detrimental effects to their health.

The taking of caribou for clothing skins is complicated by the fact that the skins are suitable for this purpose only during a few weeks in late summer, after the old hair has disappeared and before the new hair has become too heavy. The mature males are free from old hair by the end of July and the females about the middle of August. There follows a period of about two or three weeks in each case when the skins are suitable for clothing. (10)

Caribou meat is considered by Eskimo and white men alike to be the best food produced on land, and the animal is hunted industriously by the natives whenever it is within reach. In areas of comparative scarcity or in regions such as islands and peninsulas, where the animals cannot readily escape, or be replaced by new migrations, this persistent hunting, especially with modern fire-arms, has so reduced the numbers that sufficient skins for clothing are no longer available.



Two male caribou fighting



Grassy lowland on northwest end of Coats Island

Caribou are, to a considerable extent, migratory, and many opinions have been expressed as to the purposes and routes of their migrations. In recent years much new information on caribou herds and their habits has been obtained from flying operations over the barren lands and by means of questionnaires supplied by the Northwest Territories Administration to competent observers throughout the North. It now appears that the migrations are usually slow seasonal movements in search of suitable grazing grounds, and that the animals may be diverted from customary regions by depletion of the food supply from overgrazing, by ground fires which destroy the lichens, grasses, and shrubs on which they feed, and by excessive hunting with fire-arms.

Region West of Hudson Bay

While caribou are widely distributed throughout the Arctic mainland and the islands of the Arctic Archipelago, they occur in much the greatest numbers over the barren lands west of Hudson Bay. Clarke(3) estimates the caribou population of this region west to Great Slave and Great Bear Lakes at around 3,000,000 head or less, on the basis of about 60 acres of grazing land per animal. He also estimates the annual gross increase at about 750,000 head. The present report does not, of course, extend beyond the west boundary of the District of Keewatin, and it is impossible to state the caribou

population of this region since the deer in their migrations are not governed by imaginary geographical lines. Clarke, however, recognizes five groups of caribou which spend all or part of their time in this region:

- a) Those summering on the Dubawnt and Kazan Rivers and wintering in northern Saskatchewan and Manitoba.
- b) Those summering on the lower Kazan River and eastward, and wintering in southern Keewatin.
- c) Those summering in southern Keewatin and wintering in northern Manitoba.
- d) Those summering in the Wager Bay—Back River area and wintering on lakes on the Back River, Aberdeen and adjacent lakes and north of Baker Lake.
- e) Those summering in Boothia and Melville Peninsulas and wintering farther south.

The Eskimo of the region southwest of Chesterfield Inlet are essentially inland people and subsist chiefly on caribou.(1) Of these there are several groups around and northwest of Padlei who have little sea culture or traditions, and who subsist entirely on inland country produce, of which caribou meat is the chief component. From native game returns supplied by the R.C.M.P. at Baker Lake it would appear that the caribou-eating Eskimo use about 9 caribou per person annually for themselves and their dog teams. This figure seems rather low, as it means only about 1,200 pounds of meat a year per

person for human use and for dog food, and each dog alone would probably require nearly that much. It is said that these inland natives use very little fish although the latter are plentiful in many of the lakes. A report on the Bureau of Northwest Territories file, from the R.C.M.P. at Coppermine, and dated May 15th 1939, in regard to native caribou hunting in the Bathurst Inlet district states that "a family of natives requires 25 clothing skins per year . . . It would be fair to estimate the requirements of an Eskimo family and its dogs (living largely on caribou meat) at 150 head per year." It may be reasonable to assume that about 400 inland natives in Keewatin use about 30 caribou per head, and the remaining 1,000 mainland coastal natives use about 9 caribou per head per year in addition to sea-food. The white residents take about 200 head, and, in 1942-43, the traders took about 500 head to provide skins for export to regions of scarcity farther east. The total annual drain upon the caribou by all residents of the Keewatin mainland is therefore probably not less than 22,000 head. Indians living south of the tree-line in Manitoba and Saskatchewan also draw upon these herds to an unknown extent each year. Wolves, accidents during migration, and disease take a further toll, but Blanchet(1) states that the natives of this region speak of the caribou as being unchanged in numbers and in general movements in so far as they recall.

Boothia and Melville Peninsulas

North of Chesterfield Inlet caribou are scarcer and the natives depend upon the sea for a large part of their food, but conduct caribou hunts inland to obtain skins for clothing. There are caribou on Boothia and Melville Peninsulas, but their numbers have undoubtedly decreased from native hunting in recent years. Manning(8) states that the migration across Rae Isthmus to Melville Peninsula has now ceased, at least on the east side of the isthmus, and the herds are not now replenished from the large reservoir to the south. All that remains now are a few small herds moving erratically about the southern part of the peninsula. In the northern part of Melville Peninsula they have become so scarce that the Igloodik natives are often forced to use sealskin and imported materials for clothing. These natives obtain

some caribou by crossing Fury and Hecla Strait to Baffin Island, and some of them have recently moved to the east side of Foxe Basin where caribou are locally plentiful, having never been hunted until recently. In 1939 it was reported that caribou were very scarce on King William Island, and that none were ever seen on Adelaide Peninsula to the south. A report in 1940 states that caribou were present all winter on the southern part of Boothia Peninsula and the Isthmus, and that the few Eskimo there had no difficulty in securing a meat supply.

Southampton Island

On Southampton Island caribou were said to be quite plentiful prior to the opening of the trading post there in 1924. Some additional natives were brought to the Island from Coats Island when the Hudson's Bay Company post at the latter island was closed. The increase in population and excessive hunting with readily available ammunition appears to have so depleted the caribou that by 1935 it was estimated that only a few dozen animals remained, confined to the more rugged northeastern section of the island.(9) These small herds have multiplied in the protection of the hilly country and are again being hunted when they leave the sanctuary of the hills. Thirty-five were taken in 1942 and twenty-seven in 1943.

From the above noted R.C.M.P. reports it would appear that each native family could use about 25 caribou skins per year for clothing alone, or an estimated 5 skins per person. The 140 natives on Southampton Island could therefore use about 700 skins per year. On the basis of a natural increment in caribou of 15 per cent per year,(3) it would take a herd of approximately 4,500 head to supply the local demand for skins for clothing, without depleting the stock. It is not known what proportion of the island's 16,000 square miles will support caribou, but it seems quite probable the island could support a herd of this size. Since caribou meat is favoured by most natives, there is a natural tendency when caribou are plentiful to take more animals than are required for clothing alone. As previously stated, the caribou-Eskimo of the interior mainland draw heavily upon the caribou for all purposes, including dog food. On Southampton Island walrus and seal are readily obtained as a source of meat supply and

to augment clothing, and since walrus meat is much preferred as dog food it is unlikely that the drain on caribou, if available, would ever approach that of the caribou-Eskimo. At the present time the shortage of caribou meat is not a serious factor, since other sources of meat are available, but the shortage of sufficient skins for clothing causes some hardship. The Hudson's Bay Company imports caribou skins from other regions when available, but it is rarely possible to secure enough. (9) Questionnaire replies indicate that about 100 skins were imported in 1942-43.

Coats Island

Coats Island has several small herds of caribou. There has been no trading post or permanent resident on this island for a number of years, but, at intervals, when the herds have increased sufficiently, natives come from Southampton Island in whale boats and secure as many animals as possible to augment the supply of skins for clothing. This island comprises about 2,000 square miles, but unpublished reports by Dr. M. O. Malte in 1928, and A. E. Porsild in 1930, both botanists of the Victoria National Museum, seem to indicate that much of the interior is barren and that only narrow fringes along the coast at certain points support sufficient vegetation for caribou. One such area of good grazing land apparently exists at the south end of the island behind Carey's Swan Nest, where Captain H. T. Munn (11) reported the fattest caribou he had ever seen. The interior of the island and its grazing capacity have never been explored.

Baffin Island

Caribou are found over wide areas on Baffin Island, but the main herds remain in the interior around and north of Nettilling Lake. A few venture through the mountainous country to the east coast where the occasional caribou may be obtained throughout the year, but particularly in winter. In order to get skins in the late summer when they are in prime condition for clothing, however, it is necessary for the natives to proceed inland through the mountains. Land travel at this season is very difficult, and the result is that some families do not get enough skins for all purposes and have to rely on substitutes to some extent.

There are three natural factors which tend to protect the caribou in the interior of Baffin Island:

- a) The long distances and the rough country which must be traversed to reach the interior.
- b) In summer the Eskimo must walk inland to hunt and pack out the kill on his back.
- c) In winter he is busy hunting seals and trapping foxes. In order to go inland he would have to obtain sufficient seal or walrus meat to feed himself and his dogs on the trip. Since the coastal Eskimo prefers seal meat to caribou except for an occasional change of diet, there is little inducement to go inland after caribou during the winter when the skins are unsuitable for clothing.

(Caribou Questionnaire, R.C.M.P., Pangnirtung, May 15, 1935)

R.C.M.P. reports and questionnaires by the Administration and the Hudson's Bay Company indicate the relative abundance of caribou in different parts of Baffin Island in recent years.

On Foxe Peninsula and along the south coast to Amadjuak Bay caribou are reported to be very scarce or entirely absent. At Lake Harbour they are never numerous, but a few small herds were seen in the spring of 1942. East of Lake Harbour scattered caribou are found along the coast at certain seasons. The average annual kill at Cape Dorset is about 10, and at Lake Harbour about 50. Skins are imported from other regions by the traders and sold at cost to the natives to supplement their meagre local supply. A number of former residents of Cape Dorset now live in the Igloolik district and hunt north and east of Foxe Basin. These natives annually trade about 200 skins with the Cape Dorset natives. It has recently been reported that about fifteen Cape Dorset families now hunt inland to Amadjuak and Nettilling Lakes, living off the caribou and taking two years to make the round trip. These people have camps on Nettilling Lake.

Around Frobisher Bay and the west end of Cumberland Sound sufficient caribou are found within a radius of 75 miles in the fall and early winter to meet the needs of the coastal natives. From Home Bay to Pond Inlet the average annual take is about 800 head, and main reliance is upon the herds in the interior where organized hunts are sometimes conducted. A herd of caribou lives on Bylot Island. In 1941



Caribou in migration swimming a stream.

the natives were able to secure 130 head on the east and north coasts of the island which are not always readily accessible.

Between Foxe Basin and Eclipse Sound caribou are apparently fairly plentiful, but no particulars are available as to the probable density of the animals per square mile. In the vicinity of Arctic Bay and on

Brodeur Peninsula caribou are scarce, but the natives of Arctic Bay have recently obtained about 50 per year.

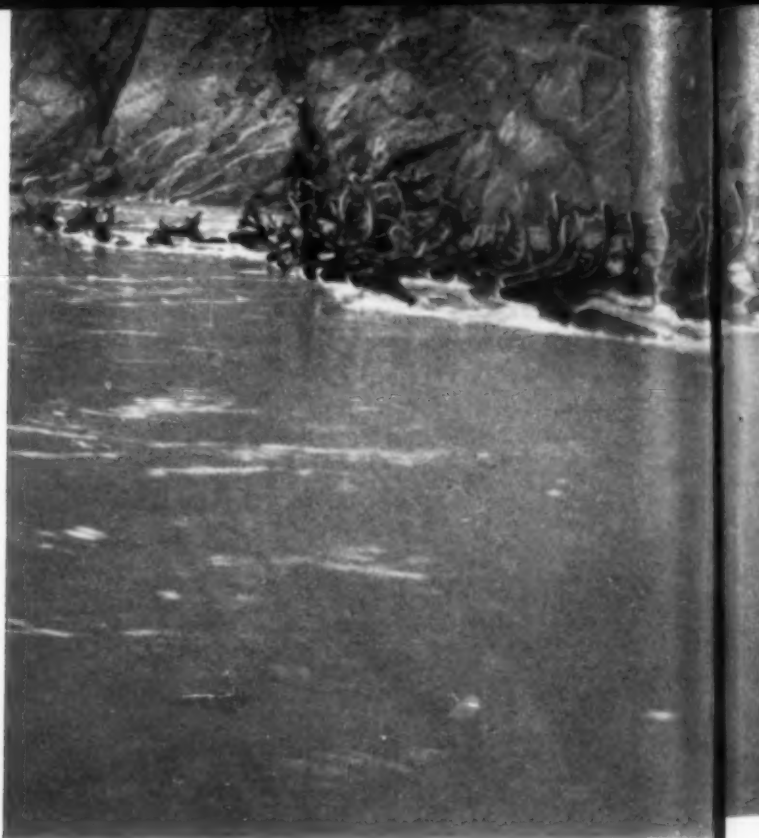
Manning(10) estimates the caribou population on a coastal strip 70 miles wide on the west side of Baffin Island from Koukdjuak River north to Piling at a conservative 10,000 head in summer, and

Caribou without antlers near
Chesterfield



admits that there might be double this number. Soper(12) [page 66] states that the entire western plains on the island are deserted by caribou during the winter because deep hard snow covers all forage from November to early May. Manning(10) found that the caribou had left the flat lands before mid-October, probably migrating toward more hilly country to the northwest.

There appears to be some conflict in the reports as to the times and routes of migration of the interior herds, or else these have changed in recent years. Information received from the Royal Canadian Mounted Police at Lake Harbour in June 1944 describes a herd of about 1,000 to 1,500 head summering north of the west end of Frobisher Bay and wintering just east of Amadjuak Lake. A main herd of 12,000 to 15,000 is said to winter just south



of Nettilling Lake and spends the period from May to September in the vicinity of Sadleq Island on the northeast coast of Foxe Basin. The southern trek of this herd is said to occur during October and the movement northwards in April. John Carrol and C. M. Duncan, land surveyors establishing mapping control points on Baffin Island in August 1943, saw very few caribou in their plane journeys in the region around Amadjuak and Nettilling Lakes and north to the Hantzsch River, which seems to support the view that caribou no longer spend their summers in this region.

The main reservoir for caribou on Baffin Island undoubtedly extends from Amadjuak Lake on the south up into the northern interior. Manning(10) uses a figure of about one caribou per square mile for the summer population east of Foxe Basin in his admittedly conservative estimate of 10,000 caribou for this region. Caribou are known to occur at all seasons in the interior north of this, over at least an additional 25,000 square miles. Some of the herds seen here no doubt have migrated from the southern plains region, but it might be safe to suggest that there is an additional 10,000 caribou in the North, and to estimate the total caribou



Centre:—Caribou swimming past steep rocky bank.

Male caribou with fully developed antlers. Females have smaller antlers.



population of Baffin Island as at least 25,000 head.

Clarke suggests 15 per cent as the probable rate of annual increase in the number of caribou in the region west of Hudson Bay, and further discounts this for natural mortality and depredations by wolves. Manning, (10) for the east coast of Foxe Basin, suggests an annual increment of 25 per cent, which he discounts to 20 per cent after allowing for losses from wolves and other natural agencies. Since wolves are less numerous per square mile on Baffin Island than in the caribou country west of Hudson Bay, and since they probably prey more upon the aged and defective animals than upon the prime productive ones, (10) it would perhaps be safe to assume that the net annual increment in caribou available for human use is at least 15 per cent, or say 4,000 head.

The Eskimo population of Baffin Island is about 2,000 persons, so that if the foregoing estimates on caribou are anywhere nearly correct, no more than two animals per person per year can be taken without depleting the herds. The following table, based on native game returns submitted annually by the R.C.M.P., indicates that the average annual rate

of caribou consumption per person on Baffin Island during the past five years is well below the permissible rate for the island as a whole. The main trouble lies in the fact that concentrated hunting in some regions has so depleted the local supply that the annual take per hunter is very small, and insufficient skins are obtained to meet local needs. This tendency of the natives to deplete the local supply of caribou is a factor which must be considered in shifting native families to regions of richer game supplies. The table on page 193 gives a good idea of the relative plenty of caribou in different regions on Baffin Island, as shown by the rate per hunter and the rate per head of dependent population. For comparison, sample figures are also given for the caribou taken in Keewatin.

The total caribou reported taken by the white residents on Baffin Island does not exceed 75 animals per year.

Northern Quebec

Northern Quebec (Ungava) is, of course, not in the Northwest Territories. The natural resources are administered by the province, but the Indians and Eskimo in the region are the responsibility of the Federal Government. It is therefore desirable to briefly outline the status of the animals in the region, in so far as they affect the economy of native life in the Arctic sections of the province.

Caribou are now scarce in Arctic Quebec (Ungava), although they were apparently abundant throughout the peninsula up to the middle of the past century. Hudson's Bay Company records and the reports of early travellers indicate that there were three main migratory herds which supported three more or less distinct Indian bands south of the tree-line, and of course the Eskimo along the treeless coasts.(4)

A western herd travelled up and down along the coast hills east of Hudson Bay and was hunted by the Little Whale River Indians and others to the south. Some migrating offshoots of this herd populated Belcher Islands.(4) There have

been no caribou on these islands for many years, and Flaherty(5) states the natives explained that the animals starved to death around the middle of the last century during an unusual winter, when heavy freezing rains covered with ice the forage plants on which the caribou depended for food. The mainland herd apparently also diminished to a state of great scarcity during the closing years of the century.

A central herd hunted by the Ungava Indians to the south passed near Fort Chimo each spring and summer.(4) Hudson's Bay Company accounts state that this herd numbered hundreds of thousands and was eventually depleted by wanton slaughter of the animals at the time of migration, by the Indians in the interior and the Eskimo of the coast. Fires which swept the country and destroyed the lichen on which the caribou grazed also speeded the decline of the herds. By 1905 caribou were becoming scarce, although even then the Indians are said to have slaughtered hundreds for the tongues and sinews alone.

The eastern herds occupied the upper George River and the Atlantic Highlands and Coasts, and supplied the Barren Ground and Davis Inlet Indians. These herds moved southwards in the autumn and northwards in the spring. The decline of caribou in this region began about 1905,

Luxuriant grass meadow near the outlet of Yathkyed Lake





Caribou herd near Carey Lake, Northwest Territories

and, by 1916, the customary migrations had ceased.(4)

There are, no doubt, several reasons for the decline of caribou in Ungava, and the subject is one worthy of careful study, of all existing records and sources of information to ascertain what steps may

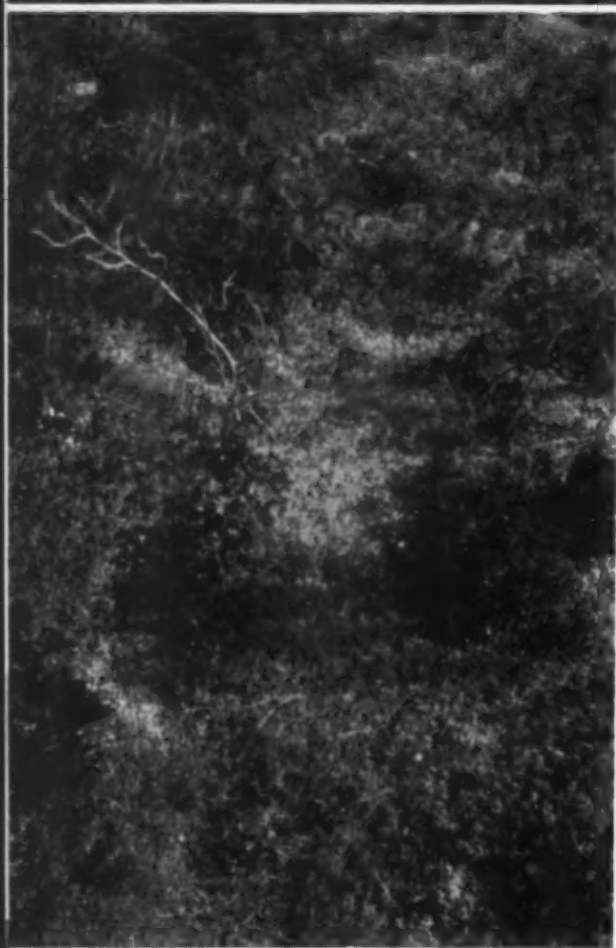
be necessary to assist the recovery of the caribou population, which is so essential to the Eskimo and Indian natives. Excessive and unnecessary slaughter by both Indians and Eskimo, with the introduction of the repeating rifle, was no doubt a contributing factor in the decline. Forest fires were

Region	<i>Baffin Island</i>				
	Average no. of hunters	Caribou taken per hunter	Total caribou taken annually	Approx. no. of natives dependent	Caribou per person
<i>Pond Inlet</i> (Incl. R. Clyde, Home Bay and Arctic Bay)	133	6	800	500	1.6
<i>Pangnirtung</i>	100	3	300	550	0.5
<i>Lake Harbour</i> (Incl. Frobisher Bay)	90	0.6	50	450	0.1
<i>Cape Dorset</i>	80	0.13	10	330	0.03
<i>*Foxe Basin Coast</i>	25	8.0	200	150	1.3

(*) Probably incomplete as to number of hunters and caribou taken.

Region	<i>Keewatin District</i>				
	Average no. of hunters reporting	Caribou taken per hunter	Total caribou taken by hunters reporting	Dependents at 5 per hunter	Caribou per person
<i>Eskimo Point</i>	40	40	1,600	200	8
<i>*Baker Lake</i>	65	43	2,800	325	8.6

(*) Probably incomplete and includes a number of coastal natives.



apparently common at the time of the caribou decline. Low(6) describes extensive fires, many of which were caused by the carelessness of the Indians in using signal fires. Burwash(2) describes a fire 250 miles long by 100 miles wide which destroyed caribou food for 100 miles south-east of Richmond Gulf in 1921. Such extensive fires, besides reducing grazing areas, could halt caribou migrations and cause the loss of herds from unsatisfactory winter food conditions. It is estimated that it takes from 15 to 20 years to replace reindeer range after it is overgrazed (7) Burned areas probably take 25 or more years to recover. Winter rainfall and frozen-over food supplies could also work in combination with halted migration caused by forest fires, or excessive hunting along the migration paths, to deplete the herds by starvation.

The true extent to which the caribou were depleted in Ungava is not known. Even at the lowest ebb there were known to be scattered herds in the interior which remained in the more inaccessible regions and no longer followed their migrations to the coast. There have always been caribou herds on the upper reaches of George River, and around Lake Minto and Payne Lake they could always be found, but, apart from the occasional small wandering herds in the vicinity of the coastal settlements, it has, for many years, been necessary to go far inland to secure skins for clothing. As a result there are never enough skins, and these have to be imported by the traders.

Replies to questionnaires give some indication of the status of caribou during the period 1940—43:

At Fort Chimo about 80 caribou are obtained in February and March from Whale River, 40 miles distant. Some additional skins are imported from the George River area. Reports by air pilots indicate that numerous herds were seen from the air in the interior. The local opinion is that the supply is increasing.

The natives at Payne Bay and Wakeham Bay obtain about 30 and 20 caribou respectively during the winter, from about 200 miles inland. There is a demand for imported skins when they are available. No caribou are obtained at Sugluk, Wolstenholme, or Cape Smith.

The Povungnituk natives obtain about 50 to 100 animals in the Payne Lake region, 200 miles distant, during the winter.

Top:—A shooting blind used by Eskimo, Kazan River, Keewatin District.

Centre:—Muskeg spruce forest east of Mackenzie River — an excellent type of winter range

Left:—Eskimo with pack dogs starting a caribou hunting trip from Baker Lake.



Caribou swimming Thelon River.

About 100 skins are imported annually by the traders.

There are a few scattered caribou around Port Harrison, and the natives get about 150 animals at Lake Minto, 150 miles inland, in the spring and fall. About 250 skins are imported by the traders.

In the foregoing an attempt has been made to summarize the principal known facts in regard to the status of barren ground caribou in the Eastern Arctic. It is apparent that in many areas there is a serious shortage of caribou skins for clothing, which could probably be relieved by more intensive game management. The form of management best suited to this country of great expanses and a thinly scattered aboriginal population could only be decided upon by competent authorities, in the light of further factual information than is at present available. This would involve intimate studies of the life history of the caribou, its predators, and the topography and grazing facilities in the regions concerned. For the present, the Administration is endeavouring to alleviate the scarcity of skins for clothing by importing reindeer skins from the highly successful Government Reindeer Station at the mouth of the Mackenzie River. As these reindeer skins become more plentiful it is possible that the shortage in caribou skins may be largely made up from this source.

Polar Caribou

North of Lancaster Sound and Barrow Strait the islands of the Canadian Arctic Archipelago are populated by a smaller race of caribou, which is paler in colour than the barren ground caribou in the more southern regions. On some of the islands along the northern fringe of the region occupied by the barren ground caribou the animals are said to be smaller than those found farther south, and it is possible these are a mixed breed of barren ground and polar caribou. These smaller caribou are found on Boothia Peninsula and on Somerset and Prince of Wales Islands. It is said that about thirty of these animals per year are required for clothing a family of five or six persons.

There are no people living at present north of Lancaster Sound, but R.C.M.P. patrols in past years indicate that polar caribou are fairly numerous on Ellesmere, Axel Heiberg, Amund Ringnes, Cornwall, and smaller islands south of these. They are also found on many of the western islands of the Archipelago. There is no information as to the density of the polar caribou population or its annual rate of increase, but it seems probable that these animals, living in a region for all practical purposes untouched by man, have reached a state of biological balance, and are not likely to change greatly in numbers so long as conditions remain as they are.

BIBLIOGRAPHY

- (1) Blanchet, G. H. (1930). *Keewatin and Northeastern Mackenzie*, Dept. of Interior, Ottawa.
- (2) Burwash, L. T. (1927). *The Eskimo, Their Country and Its Resources*, Economic survey of the east coasts of Hudson Bay and James Bay from Richmond Gulf to Rupert House, including the Belcher and other adjacent islands (Mimeo.), N.W.T. Administration.
- (3) Clarke, C. H. D. (1940). *A Biological Investigation of the Thelon Game Sanctuary*, Bulletin 96, Nat. Museum of Canada, Ottawa.
- (4) Elton, Chas. (1942). *Voies, Mice and Lemmings*, Clarendon Press, Oxford, England.
- (5) Flaherty, R. J. (1918). *The Belcher Islands of Hudson Bay, Their Discovery and Exploration*, Geogr. Rev. 5: 433—458.
- (6) Low, A. P. (1896). *Report on Explorations in the Labrador Peninsula*, Annual Report, Geol. Survey of Canada for 1895.
- (7) Palmer, L. J. (1926). *Progress of Reindeer Grazing, Investigations in Alaska*, U.S. Dept. of Agriculture, Dept. Bull., No. 1423.
- (8) Manning, T. H. (1943). *Notes on the Coastal District of the Eastern Barren Grounds and Melville Peninsula from Igloodik to Cape Fullerton*, Can. Geogr. Jour., Vol. 26: 84—105.
- (9) Manning, T. H. (1942). *Remarks on the Physiography, Eskimo, and Mammals of Southampton Island*, Can. Geogr. Jour., Vol. 24: 17—33.
- (10) Manning, T. H. (1943). *Notes on the Mammals of South and Central West Baffin Island*, Jour. of Mammalogy, Vol. 24: 47—59.
- (11) *Royal Commission on Reindeer and Musk-ox* (1922), Report, Dept. of Interior, Ottawa.
- (12) Soper, J. D. (1928). *A Faunal Investigation of Southern Baffin Island*, National Museum of Canada, Ottawa.

NOTE: Further sections under Economic Wildlife of the Eastern Arctic will appear subsequently.

CANADA'S ECONOMIC TRANSFORMATION

by C. M. SHORT*

AN economic transformation of unparalleled scope and character has taken place in Canada, with profound effects on all classes of people — their sources of income, their living habits, their moral conduct and their political ideas.

At first glance it might seem that this transformation has taken place in the war period under the stimulus of an immense armament programme; there has also, it might be noted, been an unprecedented demand for ordinary goods (about 20 per cent over that of 1939, notwithstanding supply and distribution restrictions). The changes in the national economy during this war period transcend, of course, those of any like term. The total national production has risen considerably, from a gross value of less than \$6 billion in 1939 to over \$10 billion this year (at 1939 prices). Industrial capacity is now about 35 per cent greater than in 1939, and the output of all factories and mills is more than double that of the last pre-war year. The production of minerals rose to a record level in 1942 and, while there has since been some recession (owing to the labour shortage and an accumulation of certain strategic war metals), it is of a more varied character than ever before. Agricultural production has increased by about one-third following an unprecedented demand for foodstuffs, favourable crop weather (except in 1943), and a very large expansion in live-stock holdings (chiefly in the Prairie Provinces, where the live-stock population is over 80 per cent higher than in 1939) as well as by more strenuous manual efforts of farmers to offset a reduction of at least one-quarter in the agricultural working force.

In all, the productivity of Canada is about 25 per cent greater than in 1939, a rate of growth which ordinarily would be regarded as highly satisfactory over fifteen or twenty years.

The cruel effects of The Great Depression during the 1930's upon hundreds of thousands of people, the preoccupations with the waging of this war and the fears for the future, seem, however, to have obscured, if not altogether hidden, progressive economic movements in pre-war times, though there was no regular year-to-year uptrend — wide, sweeping upturns contrasting with recessions and the almost disastrous downturn of the 1930's. But a nation's economic record cannot properly be viewed in the light of short-term developments. Even changes in the economy of an old, well-developed country over a decade are apt to be slight and of little consequence. In Canada, the period between 1928 and 1938 changed the character of the national economy so that the country no longer could be classed as mainly agricultural. Attention is directed to the accompanying table showing the proportionate standing of the various national economic units in net production. Calculations of this form of production differ from the gross value in that duplications are eliminated as far as possible, the duplications being mainly those of materials passing from the primary industries to the secondary for processing. For example, wheat which is milled into flour is, for the purposes of these calculations, kept as wheat and classified solely as agricultural production, the value added by milling being regarded as industrial production.

The shift between 1928 and 1938 from a predominantly agricultural system to a combination of agriculture, forestry, mining and manufacturing was so great and had such far-reaching consequences that it requires some detailed explanation. In that decade the average proportion that agriculture contributed to the net value of all national production declined from over one-third to about one-quarter. There were, of course, some poor crop and low price years in this period which had extremely depressing effects upon agriculture, but there were other years when this basic industry had the benefit of high crop outturns and prices, for example, the record wheat yield of 1928 and its abnormally large carry-over into 1929 when the price of this cereal grain rose to \$1.75 per bushel. So there were years when agriculture accounted for less than one-quarter of the net value of national production (in 1937 the proportion was about 20 per cent) and others when it exceeded this ratio. It is most unlikely that its average contribution could, even under the best of conditions, have been greater than is recorded, or that it ever will be greater, unless its productive area is extended considerably in a large new land-settlement project. The economic system was, and still is, influenced by strong progressive elements of a non-agricultural character.

It is a commonplace that mining in Canada expanded at a phenomenal rate in pre-war days, but we shall miss the full significance of this movement if we consider that those directly interested financially and employed in it were the only beneficiaries. In doubling its proportion to about 10 per cent of the national production in the 1929-1938 period, mining not only developed new economic territory to its own advantage but also gave constructive stimuli to other productive units, notably the industrial system, apart from nearly \$2 billion it paid out of its production for wages, salaries, materials and various services it required. It built new metallurgical plants which alone had a production value (apart from the value of ores and concentrates) of nearly \$100 million per year, raising this industry's rank from tenth to first place in Canadian industry as a whole. Moreover, the expansion in mining and metallurgy was partly responsible for the establishment of nearly twice as many copper, brass and electrical apparatus plants as were in operation prior to 1929, as well as for part of a notable growth in the chemical industry, which increased its production value to about \$100 million by 1938, a pre-war peak. In these mineral and associated developments are to be found the major causes of an expansion in general industrial productivity, one that raised the proportion of manufacturing from one-third of the total national production in the 1918-28 period to nearly 40 per cent in the following decade.

It will be noted from the table that forestry did not maintain its position in the national economy, for at one time the important lumbering section was the worst victim of the depression, its cut in 1932 being less than one-third that of normal times, while a large sector of the pulp and paper industry was suffering from what appeared to some observers as incurable disabilities. But enterprising exporters opened a large market for Canadian lumber

* Supervisor, Statistical Research, The Canadian Bank of Commerce

CANADA'S ECONOMIC TRANSFORMATION

	Net Value of National Production							
	Average 1919-28		Average 1929-38		Average 1939-42		Estimate 1943	
	\$000,000	%	\$000,000	%	\$000,000	%	\$000,000	%
Agriculture	1,123	37.1	669	25.0	1,094	24.2	1,750	25.8
Forestry	336	11.0	250	9.4	373	8.3	440	6.5
Fishing	43	1.4	33	1.2	47	1.0	72	1.1
Trapping	15	.5	9	.4	14	.3	32	.5
Mining	168	5.5	250	9.4	463	10.2	471	6.9
Electricity	72	2.4	126	4.7	184	4.1	217	3.2
Construction	187	6.2	206	7.7	243	5.4	300	4.4
Custom and Repair	66	2.2	88	3.2	121	2.7	149	2.2
Manufacturing	1,020	33.7	1,044	39.0	1,978	43.8	3,353	49.4
	\$3,030	100.0	\$2,675	100.0	\$4,517	100.0	\$6,784	100.0

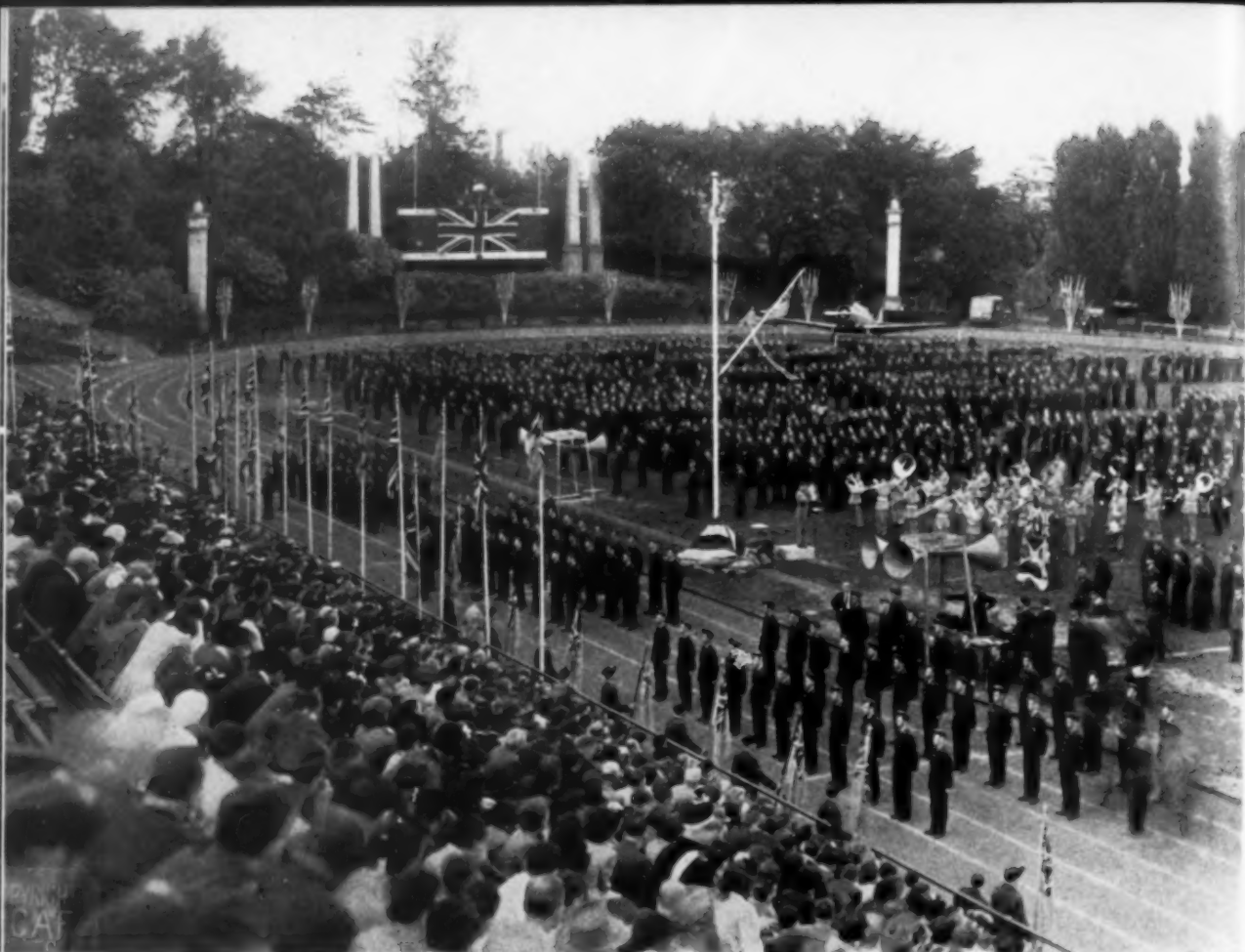
in the United Kingdom against strong long-established British connections with North European sources, and, by 1938, the cut of this country was restored to about a pre-depression level. Improved marketing conditions abroad for newsprint after 1933 coincided with an unprecedented expansion in artificial textile fibres (world production of rayon yarn doubled between 1932 and 1938) for which Canadian wood pulp was one of the raw materials.

The great change in the direction and emphasis of Canadian productivity took place in an era in which the world had lost much of its economic flexibility and constructive enterprise. World politico-economic conditions were thoroughly discouraging to capital investment in new fields of productivity, yet Canada made, in this period of depressants, the most widespread progress in her history. Perhaps most important of all, the additional industrial-mineral facilities created by this progressive movement put Canada in a position to undertake the major part of the vast armament programme she found necessary in this conflict. The results are broadly portrayed in the last two columns of the table — those showing the production of the economic units in the 1939-42 period and in the year 1943. Practically all of the privately-owned non-ferrous base metal mines and fully half of the manufacturing facilities have been used for war purposes. The necessary war-time additions to factory and mill facilities have increased the proportionate output of industry to 49 per cent of all national production and pulled down that of mining and forestry, though these two last-mentioned units were at a record peak of activity in 1942 and above their average in the following year. In the immediate post-war reconstruction period some, perhaps half, of the new war industries will disappear from production records because they do not fit into a peaceful economy. In all probability the industrial sector of the national economy will decline so as to represent about 45 per cent. Mining and forestry will likely rise to some extent. Agriculture probably will account for about one-quarter of the national production.

These post-war readjustments will result in corresponding changes in the sources and scale of the national income and in the social life of the country. These changes will involve a reduction in, and a redistribution of, the working population. According to official estimates over five million of the total population are gainfully employed in production, trade, distribution and defence, the gainfully occupied including, of course, proprietors, wage and salary earners and men and women in the armed services. A normal working force of a

country with Canada's population is $4\frac{1}{4}$ — $4\frac{1}{2}$ million people, which, if steadily employed at good rates of compensation, would mean prosperity for all. Indeed, a reduction of the present working force will, in the absence of a considerable increase in population, be essential if this country is to enjoy a healthy social life — one in which the younger generation will be kept in educational institutions long enough to be under discipline until they are well qualified to make their way in this complex world; one in which married women can devote their undivided attention to their household and family duties; and one, also, where the aged may spend the twilight of their lives in peaceful homes. The war period is not a healthy social life, in which young people leave school or university before they have completed their educational courses; where mothers turn their young children over to friends, parents or public nurseries in order to obey patriotic appeals for more factory and mill labour; and where grandmothers and grandfathers forsake retirement to help out in a war labour emergency. Many of the 400,000 people drained off the farms since 1939 for war and industrial services will again be needed by agriculture if this basic industry is to be maintained and play its important role in the post-war economy. Old farmers to-day are carrying on beyond a normal working age, and farm women and children, as well as city and town commandos, are pitching in to help sow and reap the tremendous crops necessary to meet the wartime demand for foodstuffs. This does not mean that all of the 400,000 people who have left agriculture need be restored to their former occupations, for farming has become more highly mechanized in the war years, its practice generally has improved and there is a natural growth in the farm population, most of which has recently been retained under the present military call-up system. But machines, tractors, for example, and agricultural methods cannot be left to themselves, and the net growth in population is too slow to fill the present large gap in the agricultural working force. At least half of the absentees will be needed adequately to man the farms now in operation.

After this necessary redistribution of the working population is accomplished and the national economy is better balanced, there will remain a productive system much greater than in any former peacetime era, spread over a broader area, for new fields are being opened, notably in promising mineral regions. Canada will then be able, if favourable politico-economic conditions permit, to resume the orderly productive expansion of pre-war times, and eventually reach a higher economic plane than ever in the past.



Above:—Mass inspection of three thousand Air Cadets at Montreal's Molson Stadium. In the foreground are three crack precision squads.

Left:—The moment an Air Cadet lives for! Here he is inside an Anson, about to take off for a familiarization "flip".

THE AIR CADET LEAGUE OF CANADA

by ARTHUR L. MELLING

THE Air Cadet League of Canada was formed in the dark days of 1941, to serve two main purposes. The first of these was a war purpose: so that there might be available to the Royal Canadian Air Force a pre-trained junior volunteer reserve which would act as an aircrew feeder.

As this is being written, the armies of the United Nations are pressing close to Germany and Japan. Our air forces are achieving exceptional results at a low rate of loss, and as a consequence the aircrew requirements of the R.C.A.F. are at a minimum.

Because of this it would seem that the first purpose—the war purpose—of the League has largely been served, and that the time has come to re-emphasize its second purpose: to make available a basic training in aviation that will better fit Canadian youths for peacetime careers, either in the service, in civil aviation, or in other walks of life.

The League is going ahead in this purpose, and planning its conversion to a peacetime agency with the same vigour that it tackled the military purpose in the early days of the war.

It would be difficult to say exactly where the idea of Air Cadet training started. Actually, I think it originated in many minds and many places almost simultaneously. There were individual Air Cadet groups in Canada before the League started; in Vancouver, Montreal, Windsor, Penhold, Winnipeg and undoubtedly elsewhere.

The Air Cadet League, which became the national organization, was first considered in 1940 by a group of civilians who had served with the Air Force in the last war, and who were anxious to serve again in this.

It would not be possible to give due credit to all those who contributed in the early days, but I know that we are all particularly proud of the splendid support given by so many Air Force veterans;

among them four distinguished aces of the last war: Air Marshal W. A. Bishop, V.C., C.B., D.S.O., M.C., D.F.C.; A. W. Carter, M.B.E., D.S.C., of Vancouver; Donald R. MacLaren, D.S.O., M.C., D.F.C., of Winnipeg, and George B. Foster, K.C., D.F.C., of Montreal.

The original sponsors presented the idea to Air Minister Power who was sympathetic to the need for Air Cadet training. At subsequent meetings between the civilians and high-ranking officials of the Department of National Defence for Air, the question of form was studied, and it was decided that all youths enrolled would have to be under the direct ægis of civilian bodies, nationally and regionally, who could command the respect and confidence of Canadian parents.

Once the Air Minister was satisfied that the interested civilians met this condition, he offered the full support of his department. In November, 1940, authority for the Air Cadet League to organize and administer Air Cadets was granted through an Order-in-Council.

The training given to Air Cadets is one of the most complete and productive of its kind ever offered to youth.



Right:—Arthur L. Melling, President of the Air Cadet League



Above:—Air Cadets get familiarization flights in Service aircraft of half an hour's duration.

Left:—An airman trainee helps a cadet on with his helmet.

Below:—Physical training and drill are stressed both at summer camps and on squadron parade grounds. These are camp scenes.



The present syllabus provides for 247 hours of study as follows: aircraft recognition, 28; airmanship, 28; anti-gas, 6; armament, 8; first aid, 12; hygiene and sanitation, 5; knots and splices, 6; meteorology, 12; navigation, 50; mathematics, 20; progress of war study, 10; service familiarization, 14; signals, 48, drill and physical training, flexible.

Training is generally given two nights a week. In some school squadrons classes are incorporated into the school day. The cadet year is from September to June inclusive, and ten days at summer camp.

When the Air Force assumed responsibility for training in 1942, its officers prepared a syllabus which was virtually the same as that used in the Initial Training School course of the R.C.A.F. It was thought then that, in part-time training over the course of two years, cadets would be able to absorb this knowledge, and that they would be able to skip this phase of R.C.A.F. training on entry into the Service. The idea, however, turned out to be rather ambitious, and the syllabus was modified. It was found that training had to be flexible and take into consideration varying local conditions. Often, in the smaller towns, it proved difficult to obtain competent instructors in all the required subjects: for instance, navigation and airmanship. And the educational background of cadets differed widely, particularly in the non-school squadrons. For these reasons the current syllabus has been arranged to give the squadron officers some option in choosing the subjects in which most efficient instruction can be given, and which are in accordance with the abilities and interests of the cadets enrolled. Drill and physical fitness are stressed as the nucleus of the training programme.

Training equipment issued to squadrons by the R.C.A.F. includes Coëy rifles for drill and range shooting, navigation apparatus, signalling buzzers, keys and loud-speakers, respirators and gas detectors, projectors and lantern slides for aircraft recognition, instructional films, air publications and manuals. And in each Air Force Command there are three moving picture projectors that go out on loan to

squadrons for the showing of special films of interest to cadets.

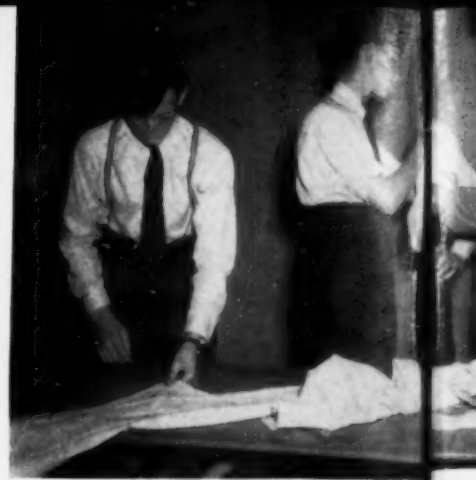
Summer camps were inaugurated in 1942, and in that summer 26 camps were held at Air Force stations and attended by 8,000 cadets. This year approximately 15,000 cadets attended camps from coast to coast. The camp programmes are prepared weeks in advance, and so planned that the cadets' days are very full. On the stations they live in airmen's barracks; eat in the regular airmen's mess; and are under the supervision of their own officers and a special group of R.C.A.F. non-commissioned officers. Customarily, one of the staff officers of the station acts as a liaison officer between station commanding officer and cadets.

On the stations cadets have lectures, drill periods and talks on special phases of Service life by R.C.A.F. officers. They spend considerable time on familiarization visits and tours. Generally they spend afternoons in the hangars, where they help the airmen with such work as may be within their capabilities. They clean and polish aircraft, move planes about, run errands for mechanics, and perform such "fatigues" as sweeping the hangars—which is never a chore as it keeps them close to their beloved machines.

This year camps were an outstanding success due to the inclusion of familiarization flights. At all camps cadets were given flights in Service aircraft: Ansons, Cansos, Bolingbromes and Dakotas among them. This is really a remarkable situation, compared to that of a few years ago when boys of the same age and spirit were left standing outside the airport fences, looking in.

Social life on the station is equally pleasant for cadets, as they are permitted the run of the dry canteen and often participate in the airmen's functions. Other features include sports days and special parades with a ceremonial review at the end of the camp by the commanding officer of the station.

Camps are held also for Air Cadet officers and instructors, of two weeks' duration, and these have proved of inestimable value. Not only do they enable instructors and officers to qualify in their



Top left:—Signalling is an important phase of training.

Centre left:—Gunnery practice on an air station

Lower left:—The importance of parachute packing is emphasized.

Top:—Essentials of first aid are taught.





Above:—Aircraft recognition and range estimation are never-ending studies for future airmen.

Below:—Dinghy drill at a West Coast summer camp

Top right:—A WD sending; Air Cadets receiving.

Centre right:—Instruction from a Flying Officer in anti-gas techniques.

Below right:—Navigation is the most difficult syllabus subject—and one of the most essential.



subjects, but they make possible very enlightening discussions of mutual problems and generally help to create a unity of spirit.

This past season a particularly exciting experiment has been tried in the Eastern Air Command, in the form of a special cadet N.C.O. summer camp. Every squadron in the Maritimes sent two or more of its best young men to this camp where they underwent rigorous special training, designed to fit them for non-commissioned officer duties, and especially to enable them to act as leaders in physical training and target shooting programmes.

Another interesting phase of Air Cadet training is that given to non-school squadrons, where the syllabus is often augmented by such essentials as mathematics, and the boys are enabled to work up to the standard set by the R.C.A.F. for aircrew recruits.

As a supplementary training aid the League publishes a Canadian *Air Cadet* magazine. This carries inspirational articles on famous fliers, articles on training subjects, and information on techniques developed by different squadrons to heighten interest.

In a factual report of this nature it is difficult to convey the character and scope of the Air Cadet movement: of the 379 squadrons spread from the Atlantic to the Pacific and from the American border to the mining towns of Northern Ontario and the farmlands of the Peace River District. To understand this you have to travel across the country and meet the cadets and the officers; the farm lads and fisher lads, the sons of bankers and lawyers and railwaymen; the mechanics and teachers and station masters and dentists, and all the others who stand on equal footing in this democratic enterprise. You have to watch the cadets' eager faces at an ensign presentation; their solemn proud look at a public induction into the R.C.A.F., when they take the oath and march away with an Air Force escort; their controlled excitement as they form part of a square with the Air Force in that signal event—a Wings Parade. You have to watch a crack Air Cadet precision squad drilling on exhibition in Rockefeller Centre, New York, and another squad drilling in a

Canadian village so remote that the inspecting officer has to fly in and land on the nearest lake. You have to go to a camp and watch the cadets ("gremlins" to the airmen) cluster around an aircraft just in off a coastal patrol; and sit with them in the mess and hear them discuss their "flips", the Spit IX, and Wing Commander McNair's latest exploit.

You have to visit the towns and cities as I did and see for yourself how community initiative can make every squadron different and exciting. In one prairie region several widely spread flights of one squadron have developed a transport system to get the boys to parades,—involving 65 miles of travel each parade night. In an Ontario town a squadron has built a unique and excellent headquarters from an old garage, with money and tools donated by local manufacturers. In another town cadets have built a glider under the supervision of one of their officers, and in still another place a squadron has a commando course for physical training.

Some of the larger squadrons have their own complete buildings, with beautifully outfitted classrooms and N.C.O.'s rooms, reading rooms and special officers' quarters, and spacious parade grounds.

Twenty squadrons have full brass bands, and ninety have trumpet or drum bands.

In many towns, the Air Cadet squadrons have become local institutions, marching in Victory Loan parades and other ceremonies. They have their own church parades from time to time, take part in salvage drives and other community efforts, have their own newspaper columns and periodic radio programmes.

The results of Air Cadet training have been very gratifying to all who have been connected with it. In the first place the cadets have succeeded well in their studies. Out of the thousands of Air Cadet examinations taken, there was an overall passing list of 80 to 85 per cent. And statistics have shown that Air Cadets who have enlisted as aircrew have scored above average marks in ground subjects at Initial Training School.

During the recent months when we have been able to keep accurate records

over 3,000 cadets have gone into the R.C.A.F., and, according to their instructors, have clearly revealed the benefits of their early training.

There have been other results, too, equally worthwhile. Those of us who have watched squadrons grow from scratch have seen unruly boys come to respect discipline, listless boys straighten up and smarten up, lonely boys find companionship, and many thousands of good average Canadian boys find a new outlet for the best that is in them, and find pride in the teamwork of the squadron.

That the results have been satisfactory from the standpoint of the Department of National Defence for Air has been attested to by the Minister, Hon. Charles Gavan Power, M.C. In his address to the Air Cadet League directors in February, 1944, Air Minister Power said:

"Thanks to you we have been able to obtain a large number of recruits who were badly needed at that time, and we hope to continue to obtain large numbers of recruits of that class and category . . .

"A large number have joined, proceeded with their training and are now on the sky battlefronts not only in Europe, but all over the world. If that were the only accomplishment, you will have done work deserving of gratitude and appreciation of the R.C.A.F. and members of the administration of the R.C.A.F.

" . . . my thanks means that of the Air Force and that of the Government for the magnificent work which you have undertaken and which you have carried out."

The Air Cadet League functions through a national board of directors, provincial committees, central and regional committees in certain large centres and sponsoring committees for each squadron.

The League has a board of 26 directors which meets at least once a year and from whose number are chosen a president, vice-presidents and an executive committee of six members which meets as occasion demands. The national board represents all provinces, and is composed of leading members of Canadian business and professional life.

The League maintains its headquarters

in Ottawa; produces the Canadian *Air Cadet* magazine, issues national publicity and assists squadrons in their promotion activities.

Within the provinces the provincial committees have responsibility for furthering the objects of the League. They provide for their own provincial financing, promote new squadrons, assist and guide squadron committees, organize and correlate publicity and other activities of interest to the squadrons at large, and maintain close liaison with the Departments of Education.

The regional and central committees, who come under the authority of the provincial committees, perform much the same functions within certain large centres.

Squadron committees organize squadrons; are responsible for their general welfare; provide financing for equipment (other than training), uniforming and amenities; provide suitable quarters for training; and recommend officers for appointment subject to R.C.A.F. and League approval. These sponsoring committees, which may properly be called the backbone of the Air Cadet movement, include business and professional men, educators and other prominent members of the community. About half of the squadrons are sponsored by schools; the other half by service clubs, boards of trade and independent civilian committees.

Most cadet squadrons are of a very substantial size. Many of them run into three and four hundred cadets; but, in order not to penalize the smaller communities, provision has been made for the affiliation of squadrons with a minimum of 25 cadets.

The actual administration of those squadrons is carried out by their officers and instructors. Officers are commissioned in a component of the R.C.A.F., known as the Air Cadet Corps, and wear uniforms identical to regular Service personnel with shoulder badges which carry the letters A.C.C.

Officers of the Air Cadet Corps receive Service pay and allowances according to rank to a maximum of 55 days a year.

Cadet ages are from 15 to 18, but there

is provision for a limited number of juniors, aged 12 to 15, in school squadrons when desired. Cadets wear a uniform similar to that of R.C.A.F. airmen, with a distinctive badge on the collar, and the squadron name and number on the shoulder.

Cadet ranks correspond to those of the R.C.A.F. from warrant officer down to Air Cadet, Second Class.

Air Cadet officers conduct the training of the squadron according to orders issued from their respective Training Commands of the R.C.A.F. They prepare cadets for examinations set by the Air Force and for annual inspection by an R.C.A.F. officer,—the Air Officer commanding the Command, or his representative.

Squadrons in good standing are presented with the Air Cadet ensign not sooner than three months after affiliation. The ensign is almost the same as that of the Air Force; a Union Jack on a field of air force blue, with an albatross surmounted by a maple leaf, in gold, in a circle of royal blue.

The presentation is generally made by a ranking officer of the Air Force or the League, and the ceremony itself is most impressive.

The League has come a long way since its inception in 1941. In the early part of 1941 a national board of key men was chosen and it met for the first time in June of that year. The next few months were extremely hectic; working on rules and regulations, drawing up training manuals and, at the same time, organizing in the provinces.

The National Board of Directors appointed provincial chairmen, who in turn set up their own committees, and these gentlemen travelled widely, talking to service clubs, boards of trade, civic officials, school boards and other public minded citizens, recruiting local sponsorship for squadrons.

The organizing of squadrons proceeded through the fall months of 1941 and by the end of December there were 79 squadrons affiliated across the country. By May, 1942, there were 135 squadrons and 10,000 cadets, and in August, 1943, 315 squadrons with 23,000 cadets.

Now, in September of 1944, we are at a new peak of strength with 379 squadrons and approximately 31,000 cadets. On strength as well are 1,728 officers; 387 chaplains and medical officers; 650 civilian instructors; and 1,920 civilians active on unit and regional committees. There are also many thousands of civilians who, independently, and as members of service clubs and other organizations, have provided financial support and taken a keen interest in Air Cadets without actually serving on committees.

Coincident with our growth, Air Force participation has grown in degree. Month by month the R.C.A.F. has augmented the training and other facilities supplied to squadrons. In the summer of 1942, it commenced summer camps for cadets on air stations, with special camps for officers and instructors. In April, 1943, it granted King's Commissions, and, finally, in the summer of 1944, it made possible the high point of all our training—familiarization flights for cadets!

From the beginning, the League and the Air Force have worked as a very close partnership, with parallel numbers in each organization at every level.

In recent days meetings have been held all across the country by squadron committees, provincial committees and national executives on the subject of post-war development, and opinion is unanimous that we must carry into the peace the spirit in which the League was conceived and fostered; though our form of organization and the details of training may have to be considerably adjusted. In this regard I refer again to Air Minister Power's speech to the directors:

"... the work you are doing now is laying a foundation for something which will be extremely important in the post-war years in Canada, and every encouragement should be given to our people young and old, and to those of you who have given their heart and soul to this work, to look forward to a great period of aerial activity in Canada after the war."

EDITOR'S NOTE-BOOK

James Goldwin Wright, author of "Economic Wildlife of Canada's Eastern Arctic—Caribou" received his early education at St. Louis de Gonzague and Valleyfield, Quebec, and continued his studies at Queen's University, where he obtained a bachelor of science degree in civil engineering in 1917—passing his final examinations for Dominion land surveyor in the same year. He engaged in land surveys, power development and municipal engineering before and after graduation, and, in 1918, entered the permanent civil service in the Surveyor General's Branch. In 1922, Mr. Wright decided that his chosen field was forestry, and entered the Dominion Forest Service. In 1929, he was given permission to organize and proceed with his proposed project of research in forest-fire hazards, and, in succeeding years, developed what became known as the Wright System for the quantitative measurement of fire hazard from day to day, preparing tables for computing and forecasting the index of fire hazard in various forest types. These tables are now in daily use as a basis for the issuing of burning and travel permits, planning of field work in the forests, and the distribution of staff by forest protective organizations throughout Quebec and New Brunswick and the National Parks in Western Canada. He has also carried out investigations in other phases of forest protection and fire control, and has written numerous bulletins on these subjects. Recognition of his many valuable contributions was given in 1942 when he was elected President of the Professional Institute of the Civil Service of Canada. In the summer of 1943 Mr. Wright was seconded to the Northwest Territories Administration to co-ordinate the efforts of various officers engaged upon an economic survey of the Canadian Eastern

Arctic to be used as a basis for post-war planning.

Arthur L. Melling, President and Chairman of the Executive Committee of the Air Cadet League of Canada, has been actively associated with the League since its inception in 1941. He worked in close co-operation with the R.C.A.F. on the organization and training programme, and, when a National Board of Directors was appointed, assumed the post of Honorary-Secretary. Born in England of a sea-faring family, he rounded out his education with extensive travel on the high seas, in Europe and in North Africa, with his father. In the last war he enlisted in the British Army at the age of 17, and subsequently transferred to the Royal Flying Corps. In 1920 he came to Canada, and spent some years lumbering in the north country. To-day he is head of a large insurance business in Montreal.

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Par le libre Désert — Through the Free Desert, by FRANÇOIS NATTAGES (George G. Harrap & Co., Limited, London, \$2.25).

This book is an odyssey. In the words of General De Gaulle, it is not an ordinary journey but rather a voyage towards honour and liberty. This itinerary from Paris to London through the Sahara Desert and the West African Jungle is an example of the many extraordinary adventurous expeditions made by volunteers of Fighting France.

We first see vividly sketched before us the chaos into which France fell during the first days of the invasion when nearly one-third of the population was fleeing before the enemy intermingled with scattered groups of the disorganized army. Some of the remarks of the author are very enlightening. While travelling through the centre and the south of France as well as through North Africa, he saw planes parked by the hundreds on the aviation fields, while in the mortal difficulties of the retreat none were used. Was it neglect or treason?

The book can be divided into two main parts, first: the description of the voyage from Port Boue near the Spanish frontier to the Niger River, second: the description of the journey through the Niger River region to Gambia, then to Freetown and England.

In the first part, we follow the author and his friend through the curious Town of Oran with its eighteenth century monuments and its French Castilian civilization, then south to Colomb Béchar, the gate of the desert, a well designed town, in the streets of which can be seen people of many races — Jews, Arabs, Negroes, etc.—who, for the most part, live in kinds of ovens in the native quarter. From Colomb Béchar, continuing the journey by trucks, we enter the desert and reach the oasis of Beni Abbes where, to their surprise, the travellers find a real hotel as well as a beautiful little swimming pool surrounded by clusters of palm trees whose bluish shadows provide them with a welcome protection against the burning rays of the sun.

From Beni Abbes, the caravan proceeds south along the hot sandy and rocky trail of the desert through Bidon V, a dry gasoline station where water is considered a real luxury, then across the first Tanzerouf Plateau to the oasis of Tesselit, the most advanced post of the French Sudan. From there the trail becomes a real road passing through steppes where flocks of sheep graze upon the scanty dry grass.

We are now on the edge of the immense plain over which the water of the Niger used to expand and filtrate into the soil. It is here that the Niger River formerly ended until the low resistance of a fault put the swampy flat country in communication with another African river, the Tilemsi, forming the Niger River such as we know it now. The Niger can be seen from the summit of a dune, and it is startling to the travellers to see this expanse of water after such an immensity of sand.

In the second part we are first taken to Goa, a port on the northern edge of what is rightly called dark Africa. In that town the olive skin of the Arabs is an exception and the white population does not exceed thirty souls.

From there the author and his friend, in an effort to evade the French police which exercised a close watch over every Frenchman travelling in the colony, boarded the boat to Bamako on the way to Dakar hoping that some unforeseen occurrence

would permit them to enter Portuguese Guinea or British Gambia. At Bamako, they left the boat and took the train for Dakar and rode as far as Kaye at which station they left the train and made their preparations to travel southwest, pretending they had been delegated by an important French syndicate to search along the Gambia River for "bourgons"—a seed from which fuel oil can be extracted. After great difficulties they reached Bissao in the Portuguese colony of Guinea but could not obtain a passport for Lisbon and, having become suspects, were told to leave the colony. Having obtained an automobile from a Syrian friend they left at night and, after many difficulties, reached British Gambia where they were kindly received by the natives who conducted them to the nearest port on the Upper Gambia. There they met a British administrator who took them by boat down the river to Bathurst from which they sailed to Freetown and from there to England.

An interesting point I wish to mention is the contrast between the French and English wartime policies in this part of the dark continent regarding white people travelling through the bush. In all parts of the French colonies adjacent to an English territory, orders have been given to all blacks who might come across a white man in the bush to make him a prisoner and to bring him to the military authorities of the region. This is a very grave and dangerous mistake to so undermine the prestige of the white man in a country where there is less than one white man for every ten thousand negroes. In the English territory, on the other hand, the British Government has given instructions that all white men encountered in the bush should be given all possible assistance.

This book is very interesting as it gives a clear description of a modern voyage through those parts of Africa that are still little known to the general public. One of its most interesting chapters is the description of the tremendous project of the "Office du Niger" a French company which has undertaken the task of damming the Niger River at the point where its waters used to expand over the surrounding plain before its connection with the Tilemsi, and to raise the water to a level sufficient to irrigate hundreds of thousands of acres of fertile land. The human side of this immense project is one of its most interesting aspects. The native villages which are being built are supplied with hygienic facilities, and the unstable blacks are being transformed into peasants deeply attached to their land. To this will be added social welfare, medical assistance, and schools which will create a new world for these primitive people. A large bridge has been built over the Niger which will be used for the passage of the Transaharian railway now under construction. Experiments are also being carried out by the company to extract fuel oil from the pourguère, a wild shrub of the castor oil plant family, which will become a profitable source of motor fuel if the results prove satisfactory.

One cannot read this book without being impressed by the patriotism of these two Frenchmen who sacrificed everything they held dear and engaged in such an adventurous enterprise to accomplish what they considered their duty toward their unhappy country. To-day Frenchmen have to perform wonders to find a way to fight the invader, and this narrative is an impressive testimony to the value, the energy, ardour and tenacity of their race.

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Far North Country by THAMES WILLIAMSON
(Duell, Sloan, and Pearce, N.Y. Price \$3.75).

A pleasantly written account of Alaska from its first emergence from the Palaeozoic slime to that future day when it will be on the aerial main line from New York to Tokyo. The author is at his best in describing incidents of the old gold-rush days, but wanders far afield in geology, anthropology, geopolitics and the current war. Canadians will be surprised by his inclusion of the Klondike in his Alaskan story. While much may be forgiven a popular writer, it is scarcely to be permitted that he take from us "Dangerous Dan McGrew" and the "Lady that's known as Lou" and even turn that staid Scottish bank clerk, Robert Service, into an Alaskan. It is quite evident that the author knows that Yukon is not a part of Alaska, but his readers will have to search diligently to find a mention of that fact in his pages.

Strangely enough there is no mention in the book of the Alaska Boundary dispute, though the purchase of Alaska from Russia is carefully covered and there is a very readable account of the Russian occupation and the activities of the redoubtable Baranov. The condition of the native population is sympathetically handled, and accounts of the reindeer industry and new farming developments are among the most interesting sections of the book. One gets the impression that our author knows his Alaska, or large sections of it, intimately, and he conveys his knowledge to the reader in a very entertaining manner. His book would have been better if he had confined it strictly to the Alaska that he knows.

P.E.P.

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